



BENCHMARKS

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Computers and Health — Issues and Protective Measures

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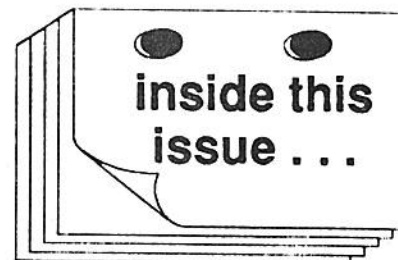
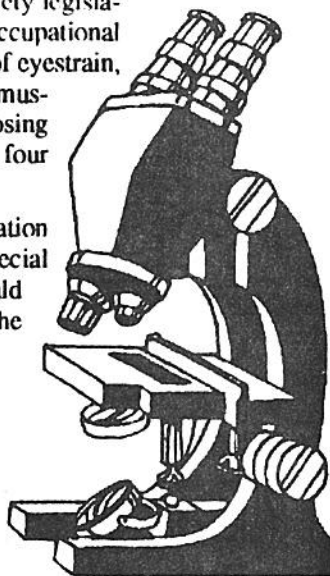
Within the past year, substantial media attention has been directed at the potential adverse health effects of long-term computer use. Unfortunately, long-term effects require long-term studies, and much research in this area is either incomplete or inconsistent. Nevertheless, because so many university staff, faculty, and students, are spending an increasing amount of time—both on campus and at home—working with keyboards and video display terminals (VDTs), and because some health effects are thought to be cumulative, we believe it is important for all computer users, lab managers, and supervisors, to be aware of these issues and the protective measures that can be taken “while the jury is out.”

One set of issues concerns workstation design, setup, and work habits. The City of San Francisco, which recently enacted worker safety legislation, cited research by the National Institute of Occupational Safety and Health into VDT operator complaints of eyestrain, headaches, general malaise, and other visual and musculoskeletal problems as the rationale for imposing workplace standards, to be phased in over the next four years (see page 4 for more information).

A second set of issues relates to suspected radiation hazards, including miscarriage and cancer. A special concern with radiation is that nearby colleagues could be affected as well, since radiation is emitted from the backs and sides of some terminals.

Ergonomics

Most people can ride any bicycle on flat ground for a short distance with no problems. On a fifty mile ride over hilly terrain, however, minor adjustments in seat height, handlebar angle, and the like



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SERVICES AVAILABLE TO USERS OF THE UNT COMPUTING FACILITIES

The UNT Computing Center is located in the Information Sciences Building (ISB), Room 119. Phone Numbers:

Computing Center: (817) 565-2324
Help Desk: (817) 565-4050
Micro Support: (817) 565-2316, 565-2319
Graphics Lab: (817) 565-3479
ISB I/O Area: (817) 565-3890
BA I/O Area: (817) 565-2350

All personnel listed below can be contacted either by calling the Computing Center or by sending them electronic mail on VM/CMS (ID-codes follow each name. All IDs are on BIT-NET node UNTVM1).

Benchmarks - Claudia Lynch (AS04)

Information & ID-Codes; Disk Space Problems, Passwords - Theresa Russell

Statistical/Research Support - George Morrow (AS01), Panu Sittiwong (AC09), Phanit Laosirirat (AC44)

Academic ADABAS/COM-LETE - Cathy Hardy (AC55)

CRSP & COMPUSTAT Problems - Panu Sittiwong (Panu), Phanit Laosirirat (AC44)

Student Programming Problems - CSCI Dept., GAB Room 550; BCIS Dept., BA Room 152

Problems with JCL, Operating Systems, or Communication/Terminal Problems - Help Desk

Data Entry; Test Scoring & Analysis - Betty Grise

Administrative Applications - Coy Hoggard

Printout Retrieval - ISB or BA I/O Operators



DIALING-UP UNT COMPUTERS OVER THE TELEPHONE

Phone numbers for accessing UNT computing systems:

300-2400 BAUD: (817) 565-3300
 300/1200 BAUD: (817) 565-3499
 300-9600 BAUD: (817) 565-3461
 300-2400 BAUD: D/FW METRO 792-4140

Area code 214 must dial 817 before the METRO #.

In your communications program, set Data Bits to 7, Parity to S, and Stop Bits to 1. The dial-up numbers have an autobaud feature that requires you to hit the <RETURN> key repeatedly once connection with the remote modem is made. This is so that the receiving modem can determine the appropriate baud rate. When you have established a communications link, a prompt (# for non-metro numbers, UNTModema> for the metro lines) will appear on your screen and you can enter one of following commands to connect with the system of your choice.

Metro Lines UNTModema>	Non-Metro Lines #	System
N/A	CALL 8040	MUSIC/SP (line editing and PCWS)
Connect VM3270	CALL 3270	Academic Mainframe Full Screen (MUSIC, CMS, Academic COM-LETE)
Connect DEC	CALL DEC	VAXcluster (VMS)
Connect Sol	CALL 900	Solbourne (Unix)
Connect Ponder	CALL 780	Sequent (Ponder)
Connect Library	CALL 3000	UNT Libraries on-line card catalogue.

HOURS FOR UNIVERSITY OF NORTH TEXAS COMPUTER ACCESS AREAS : Spring 1991*

Location	Days	Times
Computing Center RJE	Sunday Monday-Saturday	Noon-Midnight 7 a.m. Mon.-Midnight Sat. (Open 24 hours/day)
ISB 110 Terminal Area	Sunday Monday-Thursday Friday Saturday	1 - 11:50 p.m. 8:00 a.m. - 11:50 8:00 a.m. - 8:50 p.m. 9 a.m. - 8:50 p.m.
College of Business	Sunday Monday-Thursday Friday, Saturday	Noon - Midnight 8:15 a.m. - 11:45 p.m. 8:15 a.m. - 7:45 p.m.
GAB 550	Sunday Monday-Thursday Friday Saturday	2 p.m. - Midnight 8 a.m. - Midnight 8 a.m. - 3 p.m. CLOSED
Graphics Lab	Sunday Monday-Thursday Friday Saturday	1 p.m. - Midnight 8 a.m. - Midnight 8 a.m. - 9 p.m. 9 a.m. - 9 p.m.
Willis Library	Sunday Monday-Thursday Friday Saturday	1 p.m. - Midnight 7:30 a.m. - Midnight 7:30 a.m. - 9 p.m. 9 a.m. - 9 p.m.

*Hours may vary. Check MUSIC/SP, VM/CMS, VAX, or Solbourne NEWS and/or posted schedules for exceptions.

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can mean the difference between top performance and severe pain. Similarly, occasional computer users may notice no ill effects from poorly designed or badly adjusted workstations, whereas those who spend several hours a day for many years should pay careful attention to ergonomic considerations.

The key to most workstation comfort guidelines is adjustability—to accommodate different body dimensions, personal workstyle preferences, and the need to change positions to avoid fatigue. A recommended working posture (see figure at right¹) shows the body facing the keyboard and terminal, back straight, feet flat on the floor, eyes aligned at or slightly below the top of the screen, and thighs, forearms, wrists, and hands roughly parallel to the floor. Achieving this posture may require:

- ☐ A chair with a seat pan that adjusts both vertically and fore-and-aft, an adjustable height backrest, and adjustable tilting tension
- ☐ An adjustable height worksurface or separate keyboard/mouse tray (note that many keyboard trays are too small to accommodate a mouse pad, leaving the mouse at an awkward height or reach on the desktop)
- ☐ A height adjustment for the video display (a good use for those manuals you'll never read!)
- ☐ An adjustable document holder to minimize head movement and eyestrain
- ☐ Foot rests, arms rests, and/or wrist rests.

Studies show that many people are unaware of the range of adjustments possible in their chairs and workstations. If your posture deviates substantially from the diagram—or if you are experiencing discomfort—experiment with adjustments or try exchanging chairs or workstations with colleagues. A posture cushion may also prove helpful.

(Some people have been advised by their physicians to use a backless “Balans” chair, which minimizes compression of the spine and shifts the body weight forward with the aid of a shin rest. This posture may be uncomfortable, however, since it requires stronger abdominal and leg muscles than conventional sitting positions. The Balans chair is not recommended for overweight people.)

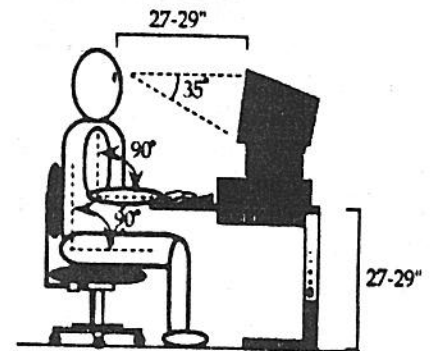
Light and glare

Eye strain and headaches are often a product of improper lighting. Ideally, terminal screens should be positioned at right angles to windows and artificial lights. That is, light sources should be neither directly behind the monitor nor behind the operator. Lights positioned to shine on the ceiling or incandescent task lighting are recommended. Other options include closing blinds and purchasing non-glare screens. If you wear glasses or contact lenses, be sure your physician is aware of the amount of terminal work you do; in particular bifocals are not recommended for extensive terminal work.

Breaks and exercises

Working in the same position for too long causes tension buildup and is thought to increase the risk of newly-recognized repetitive motion injuries, such as carpal tunnel syndrome. Therefore it is recommended that you change postures frequently, perform other work interspersed with computing (some studies recommend a 10- 15 minute break from your keyboard every hour), and do exercises such as tightening and releasing fists and rotating arms and hands to increase circulation.

¹ This figure was originally a part of “Avoiding Carpal Tunnel Syndrome: A Guide for Computer Keyboard Users” on page 5.



Radiation

For at least a decade, concerns have been raised about possible effects of radiation from video display terminals, including cancer and miscarriages. Earlier fears about ionizing radiation, such as X rays, have been laid to rest, since these rays are blocked by the glass screen. More recent controversy surrounds very low frequency (VLF) and extremely low frequency (ELF) electromagnetic radiation.

Although epidemiological studies have been inconclusive, researchers have discovered a number of ways that electromagnetic fields can affect biological functions, including changes in hormone levels, alterations in binding of ions to cell membranes, and modification of biochemical processes inside the cell. It's not clear, however, whether these biological effects translate into health effects.

Until more conclusive research is published, it should be noted that magnetic field strength diminishes rapidly with distance. Thus to reduce exposure, you should consider following recommendations published recently by Indiana University Computer Services (based on a July 1990 *Macworld* article):

- Maintain a distance of 28 inches or more from the video screen. (Beware of selecting fonts with small point sizes that require you to stay closer to the screen.)
- Maintain a distance of 48 inches or more from the sides and backs of any VDTs. (Remember that magnetic fields penetrate walls.)

A different form of radiation, static electric, can cause discomfort by bombarding the user with ions that attract dust particles, leading to eye and skin irritations. Anti-static pads, increasing humidity, and grounded glare screens are effective remedies for these symptoms.

Final thoughts

Massive computerization of offices, laboratories, dormitories, and homes represents a fundamental change in the way many of us work and communicate. It would be surprising if there were no adverse effects from such profound changes. It would also be surprising if all public policy debates were based on sound scientific evidence, rather than parochial politics and media exposés. But, as Penn bioengineering professor Kenneth Foster has written, "One difficulty is that 'safety,' if considered to be the absence of increased risk, can never be demonstrated. A hazard can be shown to exist; absence of hazard cannot."

Individuals, departments, and schools will have to weigh the evidence and make their own decisions about protective measures to take to minimize the risks of computing. A reading list is provided below.

For further information:

- Brodeur, Paul. "Annals of Radiation: The Hazards of Electromagnetic Fields." *The New Yorker*. Three part series: June 12, 1989, pp. 51-88; June 19, 1989, pp. 47-73; June 26, 1989, pp. 39-68.
- Brodeur, Paul. *Currents of Death: Power lines, computer terminals, and the attempt to cover up their threat to your health*. New York: Simon and Shuster. 1989.
- Brodeur, Paul. "The magnetic field menace." *Macworld*. July 1990, pp. 136-45.
- City of San Francisco. *Municipal Code*, Chapter 5 (Health Code), Article 23, as amended. December 10, 1990.
- Foster, Kenneth R. "The VDT Debate." *American Scientist*, March-April 1986, pp. 63-68.
- Lewis, Peter H. "Are Computer Safety Laws Taking the Right Track?" *The New York Times*, January 6, 1991, p. F8.

Highlights of the San Francisco Worker Safety Ordinance, December 1990 *

- An operator is defined as an employee who may be expected to use VDT 4 hours or more per shift.
- Workstation standards:
 - All operators to be provided with user-adjustable workstations and chairs.
 - Chair are to be upholstered, swiveling, seat pan and backrest adjustable for height and angle.
 - Arm rests, padded wrist rests, and foot rests provided upon request of the operator. Wrist rests shall enable operator to maintain neutral wrist position.
 - Terminal display support adjustable so the entire primary viewing area of the terminal is between zero and sixty degrees below the eyes.
 - Keyboard detachable from terminal, in combination with seating and work surface, adjustable so forearms, wrists, and hands can be parallel to the floor.
 - Illumination level between 200-500 lux; "task lighting" upon request.
 - Glare eliminated by shielding windows, positioning terminals at right angle to window, and/or anti-glare screens.
 - Document holder, adjustable for height and angle, provided upon request.
 - Screens free of perceptible flicker.
 - Direct noise of impact printers reduced by covers or isolation.
- Breaks (non-VDT work, rest break, or meal break) to be provided for 15 minutes after every 2 hours of repetitive keyboard work.
- Enforcement: Penalties up to \$500/day. Within 1 year: all new work station furniture must be in compliance. Within 30 months: upgrade as necessary, but not in excess of \$250/station. Within 4 years: full compliance by replacement or upgrading.

* Taken from notes by Daniel Updegrave, University of Pennsylvania, based upon reading the San Francisco legislation, identified as "File no. 118-90-5 (as amended 12/10/90)." Disclaimer: I am neither an attorney nor a public health specialist; my interest is as a computer professional. This was received from the articles database of CCNEWS, the Electronic Forum for Campus Computing Newsletter Editors, a BITNET-based service of EDUCOM. UCOM ■

- Hembree, Diana. "Warning: Computing can be hazardous to your health." *Macworld*, January 1990, pp. 150-57.
- Morgan, M. Granger. "Expos treatment confounds understanding of a serious public-health issue." [review of Brodeur] *Scientific American*. April 1990, pp. 118-23.
- Pool, Robert. "Electromagnetic Fields: The Biological Evidence." *Science*, Sept. 21, 1990, pp. 1378-81.
- Sheehan, Mark. "VDT Health risks: What to do while the jury's out," *University Computing Times* (Indiana University, Bloomington), May-June 1990, pp. 16-17.
- Sheehan, Mark. "Avoiding carpal tunnel syndrome: A guide for computer keyboard users," *University Computing Times* (Indiana University, Bloomington), July-August 1990, pp. 17-19. (see page 5)
- University of Pennsylvania Office of Environmental Health and Safety. "Health Issues and working with VDT's: a summary of the literature." *Penn Printout*, December 1988, pp. 10-11.
- University of Pennsylvania Office of Fire and Occupational Safety. "Safety Bulletin #32, Video Display Terminals." July 1990.
- University of Pennsylvania Office of Risk Management. "Policy 2608: Occupational Injury or Illness." *University of Pennsylvania Financial Policy Manual*, December 1986. ■

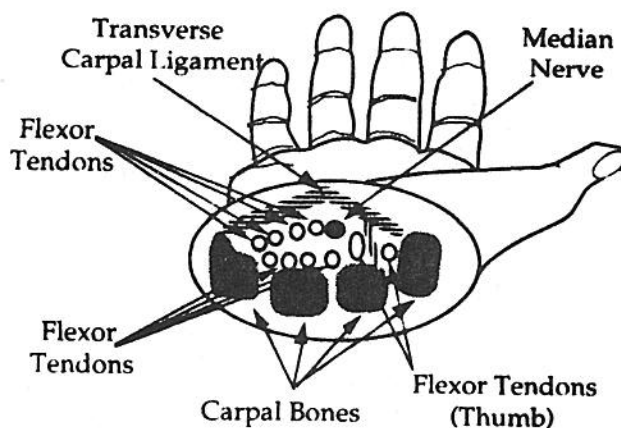
Avoiding Carpal Tunnel Syndrome: A Guide for Computer Keyboard Users

By Mark Sheehan, University Computing Services, Indiana University, Bloomington, IN 47405. (BITNET: Sheehan@IUBACS)

This article was received from the articles database of CCNEWS, the Electronic Forum for Campus Computing Newsletter Editors, a BITNET-based service of EDUCOM. It originally appeared in University Computing Times, July-August 1990, pp. 17-19. It has been edited slightly for inclusion in this newsletter.

Carpal tunnel syndrome (CTS) is a painful, debilitating condition. It involves the median nerve and the flexor tendons that extend from the forearm into the hand through a "tunnel" made up of the wrist bones, or carpals, and the transverse carpal ligament. As you move your hand and fingers, the flexor tendons rub against the sides of the tunnel. This rubbing can cause irritation of the tendons, causing them to swell. When the tendons swell they apply pressure to the median nerve. The result can be tingling, numbness, and eventually debilitating pain.

CTS affects workers in many fields. It is common among draftsmen, meatcutters, secretaries, musicians, assembly-line workers, computer users, automotive repair workers, and many others. CTS can be treated with steroids, anti-inflammatories, or physical therapy, or with surgery to loosen the transverse carpal ligament. Recovery of wrist and hand function is often, but not always, complete.



Causes

Like many skeletomuscular disorders, CTS has a variety of causes. It is most often the result of a combination of factors. Among these are:

Genetic predisposition — Certain people are more likely than others to get CTS. The amount of natural lubrication of the flexor tendons varies from person to person. The less lubrication, the more likely is CTS. One study has related the cross-sectional shape of the wrist, and the associated geometry of the carpal tunnel, to CTS. Certain tunnel geometries are more susceptible to tendon irritation.

Health and lifestyle — People with diabetes, gout, and rheumatoid arthritis are more prone than others to develop CTS, as are those experiencing the hormonal changes related to pregnancy, menopause, and the use of birth con-

trol pills. Job stress has also been linked to an increased likelihood of CTS. And CTS seems to be more frequent among alcoholics.

Repetitive motion — The most common cause of CTS that's been attributed to the workplace is repetitive motion. When you flex your hand or fingers the flexor tendons rub against the walls of the carpal tunnel. If you allow your hand time to recover, this rubbing is not likely to lead to irritation. The amount of recovery time you need varies from fractions of a second to minutes, depending on many circumstances, including the genetic and health factors mentioned above, as well as the intensity of the flexing, the weight of any objects in your hand, and the extent to which you bend your wrist during flexing.

Trauma — A blow to the wrist or forearm can make the tendons swell and cause or encourage the onset of CTS.

Prevention

Computer keyboard users can take several steps to lower their chances of developing CTS. Some of these center around the configuration of the workplace, or "ergonomics." Others have to do with human factors.

Ergonomics — Proper seating is crucial to good ergonomics. The height of your seat and the position of your backrest should be adjustable. The chair should be on wheels so you can move it easily. Arm rests on the chair, though optional, are often helpful.

Table height — To adjust the chair properly, look first at the height of the table or desk surface on which your keyboard rests. On the average, a height of 27-29 inches above the floor is recommended. Taller people

will prefer slightly higher tables than do shorter people. If you can adjust your table, set your waist angle (see below) at 90°, then adjust your table so that your elbow makes a 90° angle when your hands are on the keyboard.

Wrist angle — If your keyboard is positioned properly your wrists should be able to rest comfortably on the table in front of it. Some keyboards are so “thick” that they require you to bend your hands uncomfortably upward to reach the keys. If so, it will help to place a raised wrist rest on the table in front of the keyboard. A keyboard that requires you to bend your wrists is a common cause of CTS among computer users.

Elbow angle — With your hands resting comfortably at the keyboard and your upper arms vertical, measure the angle between your forearm and your upper arm (the elbow angle). If it is less than 90°, raise the seat of your chair. If the angle is greater than 90°, lower the seat. Try to hold your elbows close to your sides to help minimize “ulnar displacement” the sideways bending of the wrist (as when reaching for the “Z” key).

Waist angle — With your elbow angle at 90°, measure the angle between your upper legs and your spine (the waist angle). This too should be about 90°. If it is less than 90°, your chair may be too low (and your knees too high). Otherwise, you may need to alter the position of the backrest or adjust your own posture (nothing provides better support than sitting up straight). (Note: If making your waist angle 90° changes your elbow angle, you may need to readjust the height of your chair or table.)

Feet — With your elbows and waist at 90° angles, your feet should rest comfortably flat on the floor. If they don't, adjust your chair and table height and repeat the steps above. If your table isn't adjustable and your feet don't comfortably reach the floor, a raised footrest can help. Otherwise, you may need a different table.

Work routine

You need very little recovery time between keystrokes to cool and lubricate the flexor tendons. If you type constantly, however, the need for recovery builds. Further, working with your hands bent upward at the wrists or frequently bending your wrists sideways heightens the friction within the carpal tunnel. It takes longer to recover from these motions. Working under stress (deadline pressure, anger, or other anxiety) can make matters even worse.

Many studies recommend a 10-15 minute break each hour to give yourself the recovery time you need. This needn't be a break from productive activities — just a break from your keyboard. Exercises can help, too. Try the following:

- ① Make tight fists, hold for one second, then stretch your fingers out wide and hold for five seconds. Repeat several times.
- ② With arms outstretched in front of you, raise and lower your hands several times. Rotate your hands ten times (make circles in the air with the fingertips).

Variety is the key. CTS occurs most frequently in workers whose motions are not only repetitious but are kept up for hours at a time. If you use a keyboard, structure your workdays to include a mix of activities each hour. For example, instead of typing all morning and filing all afternoon, mix typing and filing throughout the day.

Early detection

The most painful cases of CTS are those that have gone undetected or untreated over a long time. CTS can be caught easily in its early stages, however, and much of the pain and all of the disability avoided.

Early symptoms include a tingling in the fingers, often beginning several hours after work activity has stopped. Because of this delay in the appearance of symptoms, many CTS sufferers don't make the connection between their work activities and the pain they feel until it's too late. The tingling can lead, over time, to stiffness and numbness in the fingers and hand, and then to severe wrist and hand pain.

For many individuals the early symptoms of CTS go unnoticed. Employers and coworkers can help one another identify the onset of CTS by watching for and pointing out any unconscious shaking of the hands, rubbing of the wrists, or unusual postures or hand positions at the keyboard.

At the first sign of CTS, you should be examined by a doctor who specializes in hand and wrist disorders. The doctor can perform a number of simple tests to detect CTS, and can prescribe specific steps for avoiding the problem.

Summary

Carpal tunnel syndrome is common among computer keyboard users. It can strike anyone, and its consequences are serious. Awareness of the problem and its causes is crucial to preventing CTS. With proper ergonomics and attention to the work routine you can prevent CTS; with early detection and treatment it need never become debilitating. The employer's attention to stress levels, proper ergonomics, and the early warning signs of CTS are important in keeping the ailment at bay in the workplace.■

Computing Could Be Hazardous to Your Health

By Jessica Dubey, Education & Documentation Coordinator of Computer User Services (Internet: jdubey@reed.edu) and Marianne Colgrove, Associate Director, Computing & Information Systems Reed College, Portland, Oregon 97202

This article is a compilation of a series of articles that appeared in Reed College's computing newsletter, GetInfo. It was retrieved from the articles database of CCNEWS, the Electronic Forum for Campus Computing Newsletter Editors, a BITNET-based service of EDUCOM. The article has been edited for inclusion in this newsletter.

What's the Problem?

People who have spent several hours a day in front of a computer for an extended period of time have noticed a variety of discomforts, ranging from mild headaches to painfully cramped neck muscles. The problems have drawn the attention of medical researchers, computer companies and a vast number of people who use computers on a daily basis.

For some of us, long hours in front of a computer can quickly turn into days and eventually years, and mild discomfort can grow into serious disabilities if we don't take precautions. What follows is a summary of some of the complaints associated with extensive computer use that have been surfacing recently in the media, as well as proposed solutions and preventive measures you can take.

Some Areas of Concern

Physical Strain & Fatigue — Poor posture and a fixed stare can lead to strain of the back, neck, eyes, and sanity, and leave you with an overall sensation of fatigue and/or stress. These symptoms in their extreme take the form of chronic back or neck pain.

Skin Rashes — The static field generated by VDTs can draw a host of little bits of dust and dirt into an invisible gritty cloud right in front of your face. People with sensitive skin or allergies may develop a rash.

Repetitive Motion Injuries (see page 5) — Repetitive motion refers to very limited movements, such as keyboard typing where the fingers move but the rest of the arm and body remain nearly stationary. Extended periods of uninterrupted typing activity can cause repetitive strain injuries such as carpal tunnel syndrome or tendinitis.

Vision Problems — Eyestrain, resulting in headaches or blurry vision, can be the result of improper lighting or failure to refocus your eyes frequently enough. Surveys thus far have not definitively linked VDT use to any long-term or permanent eye damage, although some doctors suspect monitor radiation as contributing to the incidence of cataracts in some computer users. It's important to note, however, that these suspicions have not been confirmed experimentally and are a source of controversy within the medical community.

Other vision problems reportedly related to VDT use include eye irritation, headaches, difficulty in distance focusing, or double vision.

Miscarriages and Conception Problems — By far the most controversial concern of those who are sounding the alarm about the hazards of computing is

the possibility that video display terminals emit low-level electromagnetic radiation that may be harmful to you. [See the article on "Monitor Emissions" on page 10 for more information on this.]

Should You Worry?

Let us emphasize once again the controversy surrounding all of these reports. Many experts dismiss the findings as unfounded. Others are urging the public to take the reports very seriously. Writers such as Paul Brodeur (author of a series of articles in the New Yorker which brought so much attention to the possible dangers of electromagnetic fields), urge the public not to overlook the political implications of government and industry's response to the exposure of industrial hazards. As more research is completed, scientists will be able to better identify the extent of these alleged hazards. Meanwhile, we urge you to conduct your own research.

First of all, be aware that poor posture and sedentary work environments have been around a lot longer than computers. If you are experiencing pain, even if you have only recently acquired a computer, you may benefit from taking into consideration ergonomic factors in your work space before blaming it all on your new microcomputer. It is also worth noting that some people may have pre-existing vision problems such as farsightedness without being aware of them; these conditions may become more noticeable from the strain of VDT use, while not necessarily being caused by computer use itself.

Whereas anyone who sits behind a desk would be well advised to heed ergonomic considerations as outlined on the next page, only those involved in intensive data entry need to be concerned with the dangers of repetitive strain injuries. Computer users are at higher risk for conditions such as carpal tunnel syndrome and tendinitis than regular typists, because they have the

ability to make more keystrokes faster and without interruption; they don't have to stop typing to insert a fresh sheet of paper, for instance.

Who should worry about the adverse affects of computer use? After all, most conditions are linked to "prolonged" use. Just what exactly is prolonged? Experts as well as lay people differ widely on this, though most agree that adverse effects of computing seem to appear when a user spends several hours each day in front of a computer for several days a week.

The studies cited below examined the effects of various rates of VDT use on vision; the results may help you formulate a guideline to which to compare your own work history. A *MacWorld* article¹ quotes the following opinion of the president of an office-ergonomics consulting firm: "If people spend more than four hours a day working on the computer, the incidence of physical discomfort increases dramatically." But four hours of computing interspersed with other work, stretching exercises, moving around, and looking at other things besides the screen should counter any negative effects and help keep you healthy and productive.

A Massachusetts study² showed that clerical workers who spent 7 or more hours a day at VDTs had a 72% greater incidence of eyestrain than workers who spent fewer hours a day in front of the screen. Another study in California, quoted by Hembree in the same *MacWorld* article³, examined 150 patients of an optometry clinic whose average VDT use was 6 hours a day for 4 years. The results: two thirds had problems focusing their eyes, a significantly higher incidence than in the general population.

¹Branscum, Deborah. "Comfortable Computing," *MacWorld*, July 1990, p. 88.

²Hembree, Diana. "Warning: Computing Can Be Hazardous to Your Health," *MacWorld*, Jan. 1990, p. 155.

³Hembree, p. 155.

What You Can Do

There are lots of options for rearranging your work environment and changing your work habits to reduce health risks. We've compiled a list of them here.

Reduce glare

- Try to arrange your work area so that you don't have a window in front or behind you, but at your side; the computer screen should be perpendicular to the window to cut down glare. Also place or angle the monitor to minimize reflections from overhead lights.
- Use curtains or blinds over the windows to cut glare.
- Lighting should be half the level of normal office lighting (simply unscrew half of the light bulbs in your work area).
- Replace 60hz fluorescents, which tend to flicker, with high-frequency, solid state ballasts.
- Get a filter screen. For Macintoshes, *MacWorld* recommends a filter designated as "high light transmission," since most filters cut down contrast and may make the Mac screen hard to see.

Maintain adequate distance from monitor.

Most experts recommend that users try to maintain a distance of 24" to 28" from the screen to diminish the level of exposure to VLF and ELF magnetic fields. Now, 28" is pretty far, but can easily be accomplished if you have a pull-out tray for your keyboard, or if you sit back with the keyboard in your lap. However, most desks are not deep enough to accommodate a monitor (which can take up 15" of desk space front to back) plus a keyboard 2' in front of that. A keyboard tray is one simple way to solve this dilemma. (See "Products," page 9.) Just make sure you can still see the screen clearly.

You should also maintain a distance of 4' from the back and sides of a

VDT. See the article on "Monitor Emissions," page 10 for further elaboration.

Use a headset

If a large part of your job involves being on the phone while you key information into a computer, wear a headset rather than cradling the phone with your chin. Your neck muscles will thank you.

Use a copy stand

This will keep the paper you are typing from at roughly the same distance and angle as the screen, making it easier on your eyes and neck. Since this means that you wouldn't need to refocus a lot or move your head very much, it is important to recognize that it might have the adverse effect of causing neck or back cramps or blurry vision. The best way to combat such problems is simply to take a break, stretch, and focus your eyes at a distance for several minutes at a time (see below).

Avoid repetitive motion risks

MacWorld says not to exceed 10,000-12,000 keystrokes per hour, or 1700 words. A few quick calculations revealed the following: If you whiz along at an average typing speed of 60 words per minute, you only have 28 minutes of basically stress-free keystroking before you had better stop and do something else for a few minutes. Hunt-and-peck at 30 wpm, and you can tootle along for a whole hour before taking a couple of laps around the building.

Take breaks

Since most problems arise from the body's strain due to extended periods of limited or repeated movement, the most obvious solution is to reduce the consecutive time spent at the keyboard and move around more. A short break every hour is the easiest and likely the best way to avoid most minor discomforts as-

sociated with computer use. Some studies suggest a 10-15 minute

break every hour. The ratio of work time to break time will vary with the individual and may depend upon age, physical condition, intensity of work, etc. In this type of situation, you may be your own best diagnostician. Pay attention to the signals that your body gives you and work out your own regimen for interrupting your computer sessions.

Break up your computing with different types of work. Walk down the hall or go outside, do some filing, shuffle some papers, or count off a few jumping-jacks to get the blood moving. If you're bashful, pull down the shades so nobody can see you, or pretend that you're getting in shape for the 1992 Olympics.

Stretch

Gentle stretches will ease tension and help circulation. Body parts that will most enjoy stretching after sitting at a keyboard are:

- fingers and hands
- neck
- back
- arms
- legs

Do whatever feels good to you (stretching should feel good). But remember, if it hurts ("Ouch!" hurts), STOP. If something hurts that never used to hurt, see a doctor.

Pregnancy precautions

If you are pregnant, or planning to become pregnant, you may want to discuss alternative types of work or work environments with your supervisor in order to avoid prolonged periods of time in front of a computer. If your job demands computer work, consider using a low radiation emission display or an LCD display (see the Products section, next column).

While research into the possible effects of video emissions during

pregnancy is suggestive rather than conclusive, keep in mind that

studies have indicated that even aspirin can have adverse pre-natal effects during the third trimester.

Pay attention to health

Regular check-ups and yearly eye exams will help to catch and hopefully prevent any conditions from developing that might go undetected until serious damage is done. If any of the following symptoms appear, and persist, you should seek medical attention:

- muscle tenderness or pain
- aching and tiredness of wrists, arms, shoulders, or neck
- muscle spasms
- numbness and tingling
- blurred vision and/or chronic headaches

Don't smoke

Smoking constricts blood vessels, so if you are experiencing repetitive strain injuries, which affect circulation, smoking may aggravate the condition.

Products to Make Your Computing Easier

Many computer-related products are coming into the fore, accompanied by innovative designs in office furniture and lighting instruments. For more detailed information and reviews of products, please see the article, "Comfortable Computing" by Deborah Branscum, *MacWorld*, July 1990, p. 71-88.

Furniture and desk accessories

- Adjustable desks and chairs
- Portable inclining desks
- Keyboard holders and trays that attach to your desk
- Copy stands
- Wrist rests

Antiglare screens

Available in a variety of materials, such as plastic, glass, or mesh.

Usually affect image quality, so make sure you can test the product before investing in it. Recommended for situations where other glare-reduction methods (less light, monitor position) are not an option.

Radiation shields

Grounded antiglare screens will cut glare and also shield the user from low frequency electric field emissions. But no screen has been proven to effectively block low-level magnetic fields.

Monitors

- Monitor racks and stands that swivel, adjust height.
- Monitor image enlarger. This is an attachment that will enlarge your screen image by 70/30%, depending on the product. Some distortion may occur.
- Monitor cowls which reduce VLF or ELF radiations for existing monitors.
- Low-emission monitors.
- LCD monitors (LCD monitors do not give off electromagnetic emissions).

Special glasses

Ergonomically designed lenses for computer use are available. See your eye doctor for advice.

Software

One example of a software product designed to promote healthy work habits is *LifeGuard*, developed by Visionary Software. *LifeGuard* runs as a desk accessory (DA) on a Macintosh, and reminds you at set intervals to take breaks. It also contains instructions for specific exercises and stretches you can do in your office. ■

Monitor Emissions: What We Know and Don't Know

By Jessica Dubey, Education & Documentation Coordinator of Computer User Services (Internet: jdubey@reed.edu) and Marianne Colgrove, Associate Director, Computing & Information Systems Reed College, Portland, Oregon 97202

This article originally appeared in Reed College's computing newsletter, GetInfo. It was retrieved from the articles database of CCNEWS, the Electronic Forum for Campus Computing Newsletter Editors, a BITNET-based service of EDUCOM. The article has been edited for inclusion in this newsletter.

Like all electrical appliances, computer monitors, or VDTs, emit low level electromagnetic fields. The health risks from electromagnetic fields, whether from VDTs, home appliances or power lines, are currently a subject of tremendous scientific controversy. The purpose of this discussion is to inform you about the possible risks and give you some insight into the complexity of the issue.

The Facts

To better understand electromagnetic emissions, it helps to get an idea of how the monitor works. At the back of the monitor the flyback transformer shoots an electron beam toward the front of the picture tube. The beam hits a phosphor coating on the tube and creates visible light. Coils wrapped around the yoke of the tube create a pulsing magnetic field, which causes the electron beam to scan horizontally and vertically, thus refreshing the screen image about 60 to 75 frames per second.

There are several pertinent facts about VDT emissions:

- The electromagnetic field is, as the name implies, really made up of two components, an electric field and a magnetic one.
- Because of the different horizontal and vertical scan frequencies, monitors emit electromagnetic fields at basically two different frequencies, known as Very Low Frequency (VLF) and Extremely Low Frequency (ELF).
- Higher frequency fields are blocked by the monitor's glass screen.
- Electromagnetic radiation from monitors is non-ionizing radiation, meaning it cannot break apart atoms the way ionizing radiation, such as X-rays, can.
- The electromagnetic field is stronger around the back and sides of the monitor, closer to the flyback transformer and the coils.
- The strength of the field drops off dramatically with distance.

The Controversy

The controversy has to do with how electromagnetic fields, with all these different variables — electric vs. magnetic components, frequency, intensity, and distance — affect humans, if indeed they do at all. Low level electromagnetic radiation has been associated with increased rates of cancer, miscarriage, and birth defects. However, most studies do not demonstrate a causal relationship between VDT usage and health problems.

Epidemiological studies tend to look for unusual clusters of health problems, and then isolate the variables that might be causing them. A Kaiser Permanente study, for example, found that women who work at VDTs for more than 20 hours a week

had a higher rate of miscarriage. The main problem with this study is that it cannot isolate the cause of the miscarriages—it could be some other factor associated with their work, or where they live.

One common confounding variable is that we are constantly exposed to electromagnetic fields from electric appliances and power lines. Of course most people don't spend hours each day in front of their toasters. Electric blankets and TVs are probably the only devices that outdo computers for the amount of time people spend near them. Another confounding variable is stress. Some jobs that expose people to electromagnetic fields are inherently stressful. For example, productivity levels of many VDT operators are measured through the computer itself. Knowing that they're being constantly monitored is clearly stressful for many VDT operators.

Laboratory studies avoid such complicated variables by looking at the effect of VLF and ELF radiation on cellular activities, or on animal development, in a controlled environment. Low frequency radiation may affect hormone levels, change biochemical processes within the cell, and interfere with the small electromagnetic fields produced by cells themselves, but it is not known how such cellular changes translate into health risks. Some animal research supports epidemiological findings of increased rates of cancer and miscarriage. But, as with all animal research, it isn't understood how these findings apply to humans. In addition, many of these results are not consistently reproducible in the lab.

The Upshot

The scientific community has aligned itself into two polarized camps. On the one hand some argue that there is no conclusive evidence linking VDT use with health problems, and no cause for concern about low level, low frequency radiation. Others respond that even if

current evidence is inconclusive, it certainly warrants further research from the scientific community as well as from computer manufacturers.

Until this controversy is resolved, there are no real accepted standards for VDT use. In the meantime, a reasonable common sense approach is to sit further away from your monitor, since the strength of electromagnetic fields diminishes rapidly with distance. (See "What You Can Do," page 8, for details.) ■

Take the Pain Out of Computing

This is an edited portion of an article that was first printed in the University of Houston's computing newsletter, The Open Channel, edited by Jim Bradley (ACSH@UHVMI), April 1988. It was retrieved from the articles database of CCNEWS, the Electronic Forum for Campus Computing Newsletter Editors, a BITNET-based service of EDUCOM.

The best way to avoid discomfort at the terminal is to be in great physical shape. However, since we cannot all be Arnold Schwarzenegger, we are prone to slumping, slouching, and other weak-muscled behaviors that can lead to a lot of physical discomfort. Bearing this in mind, how can we compute as comfortably as possible?

Good posture is number one. Mom was right when she told you so many times to sit up straight. Sitting straight and frequently shifting position help you tremendously in reducing neck and back strain.

- Keep your neck, upper back, and lower back aligned. Slouching strains the spine's natural curve.
- Adjust your chair height so that your weight is shifted off your spine.
- Keep your arms at the same level as your desk.

New Study Rules Out VDT-Miscarriage Link

A study conducted by the National Institute for Occupational Safety and Health in Cincinnati indicates that pregnant women who use video display terminals at work face no increased risk of miscarriages. The study was reported in the *New England Journal of Medicine* and quoted in the April 1991 *Buffer*, the newsjournal of computing at the University of Denver. ■

- Keep your feet flat on the floor to maintain good posture and to aid circulation.
- Shift your position frequently to avert the tension brought on by immobility.

Take frequent breaks. Stop every 20 minutes or so and perform a few simple exercises. All of these exercises help your muscles release lactic acid, which builds up in your muscles when you are tense and causes painful, burning sensations in the muscles.

- Roll the head gently from side to side and front to back. Never crack your neck to relieve tension; cracking the neck actually causes ligament laxness and weakened neck muscles.
- Shrug your shoulders and arch your back, bringing the shoulder blades together.
- Stretch your arms out to the side and twist them as though you were opening door knobs with your hands.

Stand up from time to time and move around. Stand up every hour or so to stimulate blood flow. Poor circulation is one of the major culprits when you're uncomfortable after long hours in front of the computer.

Try some of the following exercises for specific complaints. (The following exercise ideas and descriptions were taken from *Fitness at the Terminal — Comfort Tips for Computer Users*, a booklet published by the Health Information Library, a division of Krames Communications.)

- **Upper Back Stretch** — Raise your hands to your shoulder. Using your arms, push your shoulders back. Keep your elbows down. Hold for 15 seconds. Repeat three times.
- **Lower Back Stretch** — Make sure your chair is stable if it has rollers. Lower your head and slowly roll your body as far as you can toward your knees. Hold for 10 seconds. Push yourself up with your leg muscles. Repeat three times.
- **Arm Circles** (to relieve shoulder stiffness) — Raise your arms to your sides, elbows straight. Slowly rotate your arms in small circles forward, then backward. Lower your arms, then repeat three times.
- **Wrist Flex** — Put your right elbow on a table, hand raised. With your left hand, gently bend your right hand back toward your forearm. Hold five seconds. Repeat with your left hand.
- **Finger Fan** — Hold your hands out in front of you, palms down. Spread your fingers apart as far as you can. Hold for five seconds, then make a tight fist. Repeat three times.

Be Careful

Anyone who has had physical injuries should be doubly mindful of these tips, but everyone can benefit from them. One piece of good news about computing for long periods of time is that working the keyboard is very good for the forearms and hands. In fact, some doctors recommend this type of activity for their patients who suffer from arthritis in these areas. ■

Director of Academic Computing Resigns, Acting Director Named

By Claudia Lynch, *Benchmarks* Editor (BITNET: AS04@UNTVM1)

Dave Molta, who has headed Academic Computing since June of 1987, has resigned, effective May 17, to take a position as Director of Network Systems at Syracuse University. Syracuse, New York is Dave's home town and it has been a long-time goal of his to move back to that area to be closer to his family.

While at UNT, Dave has been instrumental in the development of the campus Novell internetwork. He has been a member of the advisory panel for *Networld* — the largest conference on computer networking in the U.S. — since 1989. He has also chaired numerous sessions and given a variety of presentations at national networking conferences. Also while at UNT, Dave co-authored a book with Dr. Paul Schlieve on Novell's Netware and has written several articles for computer publications, including *Hardcopy*, *PC-WORLD*, and *Network Computing*. He was instrumental in forming the Computing Center Microcomputer Support Group. He will be missed in many areas throughout the UNT campus. We wish him well.

Dr. Philip Baczewski, the current Manager of Academic Mainframe User Services, has been named Acting Director of Academic Computing. Dr. Baczewski, who has been an employee of the Computing Center since 1983, has expertise across a wide range of computing platforms including PCs, Macs, VAX/VMS, UNIX, MVS, and VM/CMS. He started working in the Operations section of the Computing Center, while he was a doctoral student in the School of Music. He became MUSIC Time-sharing System Coordinator in 1987 and was named MUSIC and CMS Systems Coordinator and Graphics Lab Manager in 1988. In 1989, after a re-organization of Academic Computing Services, he was named Academic Mainframe User Services Manager. He has been the Associate Editor of *Benchmarks* since 1987 and writes two monthly columns for the newsletter — "BITNET Connections" and "The List of the Month."

Dr. Baczewski was heavily involved in the School of Music Ear-training Computer-assisted Instruction lab from 1979-1983, where he was Operations Coordinator and also systems programmer. He owns an Amiga 2000 microcomputer and is active in the field of computer composition. His composition *I=3=1* for computer generated tape was recently presented at the *Society of Composers Inc. Region VI* conference at UT Arlington. If you haven't already met Philip, come by and say "Hi." ■

Staff Gives Presentations, Receives Honors

Three members of the Administrative Computing Staff gave presentations at the Seventh Annual CAUCUS Conference for Software AG users in Dallas, April 21-24. Bill Buntain, Payroll/Personnel Data Systems Team Leader, gave two presentations: "Shifting Workload from Mainframes to LANs Using NATURAL CONNECTION and Clipper" (see page 29 — this received a \$200 award for best presentation in its section) and "The Role of Analysis in the Buy/Build Decision." Mahshid Grooms, Student Services Data Systems Team Leader, presented "Financial Aid Downloads Using NATURAL CONNECTION." Don Swatloski, Data Base/Central Programming Support Team Leader, presented "Securing ADABAS Utility Execution in a Classroom Environment." Swatloski's presentation also received a \$200 award for best presentation in its section.

The week of April 21-24 was very lucky for quite a few Computing Center Staff members. Cathy Hardy, Academic Database Coordinator won a Sony Watchman while attending the Big D CAUCUS. Billy Barron, VAX/UNIX System Manager won approximately \$1,000 worth of software (SCO Open Desktop Personal) while attending the SCO Open System Seminar. ■

Call For Papers

We have received the following "calls" for papers from various organizations.

- **Student Paper Competition: Computer Security, Audit and Control** — Sponsored by ACM/SIGSAC, the purpose of the competition is "to increase the awareness of security, audit, control and ethics as they apply to the computing field." A \$1,000 award will be given to the student or junior faculty member whose paper is selected by the review

committee as the outstanding contribution of the year.

The contest is open to all full-time undergraduates, graduate students and junior members of the faculty of a recognized or accredited institution of higher learning. Only those who have not previously had a paper published in a referred journal in which he or she was the lead or sole author will be eligible for the award.

General Information

Papers must be received by the SIG-SAC Competition Committee Chairman on or before October 7, 1991. For more information contact:

Dr. Harold Joseph Highland, FICS
SIGSAC Competition Committee
562 Croydon Road
Elmont, NY 11003-2814
Phone: (516) 488-6868
E-mail: Highland@dockmaster.ncsc.mil

- **DPMA Virus Conference** — Fifth Annual Computer Virus & Security Conference to be held March 12-13, 1992 at the World Trade Center in New York City. Deadline for paper submission is December 24, 1991. Topics of interest include:

- Prevention, Detection, and Recovery from Viruses and other Unauthorized Usage.
- Case studies of mainframe, pc &/or network security.
- Access control, accountability, audit, data recovery.
- Surveys or demonstrations of products & techniques.
- Particulars of LAN, UNIX, cryptography, military use.
- Computer crime, law, data liability, related contexts.
- US/international sharing of research & techniques.

For more information contact Judy S. Brand, Nationwide Computing (800) 835-2246, x190. ■

Important ID Code News

All MUSIC, CMS, and VAX Class IDs (ID codes JA(X) thru RZ99) will expire on Saturday, May 11. If you wish to access your files beyond this date, you must apply for an individual MUSIC, CMS, or VAX ID Code **IMMEDIATELY**, so that your files may be transferred. If you need your files **after** May 11 make your request **NOW** for an individual ID Code, and ask that your class files be transferred. Individual ID Code application forms may be obtained from the Computing Center offices (ISB 119). ■

Semester Break Hours

Location	Dates	Times
Computing Center RJE	May 10-June 2	Regular Hours
ISB 110 Terminal Area	May 10 May 11 May 12, May 18-19, May 25-26 May 13-17, May 20-24, May 27-31 June 1 June 2	8 a.m. - 6 p.m. 9 a.m. - 6 p.m. CLOSED 8 a.m. - 5 p.m. 9 a.m. - 6 p.m. Resume Regular Hours
College of Business	May 10 May 11-June 2 June 3	8 a.m. - 4 p.m. CLOSED Resume Regular Hours
GAB 550C	May 10 May 11-June 2 June 3	8 a.m. - Noon CLOSED Resume Regular Hours
Graphics Lab	May 10 May 11 May 12, May 18-19, May 25-26 May 13-17, May 20-24, May 27-31 June 1 June 2	7:30 a.m. - 6 p.m. 9 a.m. - 6 p.m. CLOSED 8 a.m. - 5 p.m. 9 a.m. - 6 p.m. Resume Regular Hours
Willis Library	May 10 May 11 May 12, May 18-19, May 25-26 May 13-17, May 20-24, May 27-31 June 1 June 2	7:30 a.m. - 6 p.m. 9 a.m. - 6 p.m. CLOSED 8 a.m. - 5 p.m. 9 a.m. - 6 p.m. Resume Regular Hours
Chilton Hall Computer Lab	May 10 May 11-June 2 June 5	CLOSE 3 p.m. CLOSED Open 8 a.m., Resume Regular Hours
Technical Writing Lab	May 3-June 2 June 3	CLOSED Resume Regular Hours ■

Going Somewhere? Please Read This

If you're graduating or will be off-campus and away from your computer accounts during the semester break, **PLEASE** remember to de-subscribe to any electronic mailing lists that you may be on. If you're graduating or otherwise leaving the University, electronic mail and LISTSERV files will continue to arrive until your User-ID is deleted, which could be months later. This puts an unnecessary load on the storage facilities of the computer systems where you receive your mail. It is also extremely irritating to the people who manage the LISTSERVS, who will eventually get return messages stating that mail was un-deliverable to you.

So...be nice, if don't plan on reading your electronic mail for a week or more send a message like the following (you can always re-subscribe when you return):

On VM/CMS:

- To **suspend mail** on a specific list:
TELL LISTSERV@location SET listname NOMAIL
- To sign-off a **specific** list:
TELL LISTSERV SIGNOFF listname
- To sign-off **all** lists:
TELL LISTSERV SIGNOFF * (NETWIDE)

On VAX/VMS:

Use the same commands as above, substituting the word **SEND** for 'TELL.'

To Get Back on the Lists:

Use the TELL or SEND command, as illustrated above, with the command **SUBSCRIBE listname your name**. Note: You will need to do this for each individual list you want to subscribe to.

If you suspended your mail, send the same message you sent before, but substitute the word **MAIL** for NOMAIL. ■

THE BITNET CONNECTION

By Dr. Philip Baczewski, BITNET INFOREP (BITNET: AC12@UNTV.MI)



*This Column is a continuing feature of **Benchmarks** intended to present news and information on various aspects of the BITNET wide area network.*

Managing that Mail

OK. You've managed to sign on to a few BITNET mailing lists; sending and receiving mail is now a familiar process; you're starting to feel like a BITNET pro. So, how is it that some people out on BITNET seem to be able to include previous messages in their replies, and where do those fancy signatures come from, and what do you do with all of that mail? This column seeks to answer those questions for those accessing BITNET from the VAX/VMS or VM/CMS systems. Including message quoting on replies, creating and using signature files, and managing your mail messages can have a significant effect on your use of BITNET. Here are some tips in these areas which will make you even more of a BITNET pro.

Can I quote you on that?

On both CMS and VMS, when you forward a message, that message text is automatically included, allowing you to add introductory comments or annotations within the text. Including message text within a reply, however, usually requires that you use an option or qualifier when issuing the **REPLY** command. Fortunately, this is a very simple process. On CMS, while reading a message enter the command **REPLY TEXT** on the command line (===>) and press <ENTER>. The message text will automatically be included in your reply and greater-than signs (>) will be placed at the beginning of each of the quoted lines to indicate that is quoted text. You can then add your reply at the bottom of the message, or insert your comments after each of several points or questions within the original.

On the VAX, the command to use is **REPLY/EXTRACT**, entered from the **MAIL>** prompt when reading a message. As with CMS, the message text will be automatically included, however, the VAX mail program does not use the greater-than sign or any other character to indicate quoted text. You might wish to indent the lines of your reply to set them off from the original message. On either system, you might consider deleting lines which do not directly apply to your reply unless they are necessary to clarify the entire message. Remember that a shorter message requires less resources to send over BITNET, and ultimately occupies less space in someone's mailbox, a trait often appreciated in mail messages.

Give Me a Sign

When you are sending mail across BITNET or to the Internet, you often want to include more identifying information about yourself than can be contained in the mail header. The usual practice on BITNET or the Internet is to include a signature at the bottom of your message. A signature might contain your name, department, organizational affiliation, geographical location, and electronic mail addresses. Some signatures are fairly simple, and others tend to be quite elaborate, with logos or symbols drawn out with the characters available. You shouldn't get too carried away in creating a signature. Remember that some people may be paying cash out

General Information

their own pocket to store your mail messages and the bigger your signature, the more money you are costing them. Its best to limit your signature to four lines.

A simple signature might look like:

Philip Baczewski
Academic Computing Services
University of North Texas
Denton, Texas

BITNET: AC12@UNTVM1
Internet: ac12@vaxb.acs.unt.edu

A fancier signature might look like the following (actually received on a mail message):

```

//  AMIGA  \
X//  AMIGA  \
|-----|-----|-----|-----|
| AMIUSER @UA1VM.UA.EDU |
| AMIUSER @UA1VM.BITNET |
|-----|-----|-----|-----|
| "THE COMPUTER FOR THOSE OF US WHO USE BOTH SIDES OF OUR BRAINS" |
|-----|-----|-----|-----|

```

Obviously, typing four or more additional lines of text on every message you send over BITNET could get to be a bit tedious. Fortunately, there are some techniques which will help you include a mail signature with minimal effort. On CMS, you can create a file named `<userid> SIGNATUR`, where `<userid>` is your CMS userid, containing the lines of your mail signature. The contents of this file will be appended to your mail message whenever you enter the `SIGN` command from the command line while preparing a message or reply.

CMS also allows you to specify that your signature always be appended to outgoing mail. To set up your mail with that option, you will need to create a file named `MAIL.USER XEDIT` and include the line: `SETMAIL SIGNATURE AUTOMATIC`.¹ If you don't wish to include your signature, on a message to a frequent correspondent for example, you can enter the `UNSIGN` command from the command line when preparing a message. You can also have alternate signatures in other files that you prepare. To sign using one of these other files enter the command `SIGN <filename> <filetype>`, where `<filename>` and `<filetype>` identify the file containing the alternate signature you wish to use.

The VAX mail program does not have any features for automatically including signature files, however, you can still include them manually using native features of the editor you use for preparing mail.² For EDT, go to the end-of-buffer (EOB) marker and use the command sequence:

```

<CTRL-Z>
INCLUDE <filename>
C

```

For TPU, go to the end-of-file (END OF FILE) marker, press `<F4>` and enter the command: `INCLUDE <filename>` from the Command: prompt.

This process can be automated for both editors. For EDT, create a file named `EDTINI.EDT` (EDT initialization file) with the lines shown in the next column.

¹ For more information on customizing your CMS mail, enter the command `HELP MAIL PROFILE` from the CMS READY; prompt.

² You can specify the editor you wish to use for mail by using one of the following commands from the VAX MAIL> prompt: `SET EDITOR EDT` (to use the EDT editor) or `SET EDITOR TPU` (to use the TPU editor)

To find out your current mail editor use the command `SHOW EDITOR` from the MAIL> prompt.

```

!Create SIGN macro for mail
define macro sign
find =sign
insert; type end
insert; include SYSSLOGIN:MAIL.SIGN
find =main
lend of macro

```

When you wish to include your signature, you then only need to enter the command `SIGN` from the * prompt.

You can create a TPU EVE "macro" in a file called `SIGN.EVE` with the following:

```

BOTTOM
INCLUDE SYSSLOGIN:MAIL.SIGN

```

When you want to sign your message, press `<F4>` and enter the command `@SIGN` from the Command: prompt. Both of these examples assume that your signature is contained in a file called `MAIL.SIGN` located in your home directory.

Managing those Messages

When you are receiving multitudes of BITNET mail messages, your electronic mailbox can get pretty full and hard to manage if you don't delete your old messages. Often, however, there are messages you want to keep. Both CMS and the VAX provide facilities for filing mail you wish to keep, moving it out of your active mailbox. You can even maintain like collections of mail messages, messages from one particular BITNET mailing list, for example.

On CMS you can file your mail using the `LOG` command while reading a message. Entering `LOG` by itself (or by pressing `<PF11>`) will copy mail to a file called `ALL NOTEBOOK`. A better strategy is to use individual notebooks. If, for example, you wanted to save a message about the SAS statistical programming language you could enter the command `LOG SAS` on the command line and your message would be copied to a file called `SAS NOTEBOOK`. Once you have logged a message, you will still need to discard it from your mailbox by pressing `<PF9>` (Discard).

CMS also provides a facility, called **MAILBOOK**, for managing your notebooks. If you enter the **MAILBOOK** command by itself, you will see a full-screen listing of all of your notebooks and can then select any of them for further examination. You can also enter **MAILBOOK <notebook name>** to manage one particular notebook. Once inside **MAILBOOK**, you will be able to read, forward, reply to, and discard messages just as if you were within **MAIL** itself. You can also use the **MOVE** command to copy a message to a different notebook and discard it from its current one. For more information on **MAILBOOK**, enter **HELP MAILBOOK** at the CMS **READY**: prompt.

Management of mail messages on the VAX is all done within the Mail program. To save a message while at the same time removing it from your mailbox, you can use the **MOVE** command. For example, to save a message about SAS, while reading that message you might enter the command **MOVE SAS** from the **MAIL>** prompt. This would move the message to a mail folder named SAS while at the same time removing it from your mailbox. If you don't currently have a folder named "SAS," the mail program will ask you if you wish to create one.

To see a list of the folders you have, enter the command **DIR/FOLDER**. A couple of special folders are maintained by the Mail program itself: **NEWMAIL** is the folder into which all new mail messages are received; **MAIL** is the folder where read but unfiled messages are stored, your "mailbox." To see a list of messages in a particular folder, type **DIR <folder name>**. To manage messages in a particular folder, you can also enter the command **SELECT <folder name>** at the **MAIL>** prompt and then type **DIR** to see the list. You can read a particular message simply by entering its associated number at the prompt. Since you are working within the Mail program, all functions of Mail can be applied to filed messages. ■

LIST of the Month

Each month we will highlight one of the BITNET LISTSERV Special Interest Group (SIG) mailing lists. This month's list...

MEDNEWS@ASUACAD

Coordinator: David Dodell (ATW1H@ASUACAD)

MEDNEWS: for distribution of the Health Info-Com Network medical newsletter. This newsletter is distributed weekly and contains the latest MMWR from the Center for Disease Control, weekly AIDS Statistics, FDA bulletins, medical news from the United Nations, plus other assorted medical news items.

This month's list falls into the category of an electronic newsletter, rather than a discussion list. MEDNEWS, however, can keep you up to date on the latest developments in the areas of medicine and health. To receive the latest medical news "hot off the electronic presses," send the following command as an interactive or mail message to LISTSERV@ASUACAD:

SUBSCRIBE MEDNEWS your name

Please see page 26 for important metro line information.

National "Information Highway" a Real Possibility

According to an article in *Manage IT*, a publication of CAUSE — The Association for the Management of Information Technology in Higher Education, Senator Al Gore (D-TN) and Representative George Brown (D-CA) introduced twin bills, both entitled "The High-Performance Computing Act of 1991," in the Senate and House in late January, 1991. The bills call for authorization of \$650 million in spending for the National Science Foundation and \$338 million for the National Aeronautics and Space Administration between 1992 and 1996 for development of a multigigabit network for businesses and higher education. The Senate version, S.272, was reported out of the Commerce committee virtually unchanged on March 19.

President Bush has already signaled commitment to such a network. His fiscal 1992 budget recommended that Congress allocate \$149 million for high performance computing, including the National Research and Education Network — NREN. ■



Information Resources Council News

Minutes provided by Sue Harrison, IRC Recording Secretary

The Information Resources Council met on Tuesday, March 19, 1991, and conducted items of business which are briefly summarized here:

Richard Harris presented a draft document of Policies and Procedures for Allocations and Expenditures of Computer Services Fees for General Access Computer Labs Support which he had prepared, and reported that the Steering Committee has agreed to proceed with allocation of the money collected from these fees as outlined in the IRC Sub-committee's recommendation. After IRC approval of the Policy document, the Provost, Ray Vondran and Harris will meet to begin implementation of the procedures. A motion was made and passed to recommend the policy to the Steering Committee.

The Council discussed expansion of the IRC membership to include representation from the College of Music and the School of Community Services. Consensus was that the membership should be as balanced as possible regarding administrative and academic representation, that other user groups be represented, and that the group not get too large. Nominations for new members will be accepted at the next IRC meeting.

Richard Harris reported that Don Maxwell, Chair of the Department of Information Resources, had been here for a visit, during which he was shown Computing Center, BCIS, CSCI and CECS facilities and introduced to the Chancellor and various other people. Harris stated that Maxwell left with a very positive impression of UNT and later wrote a letter expressing that view.

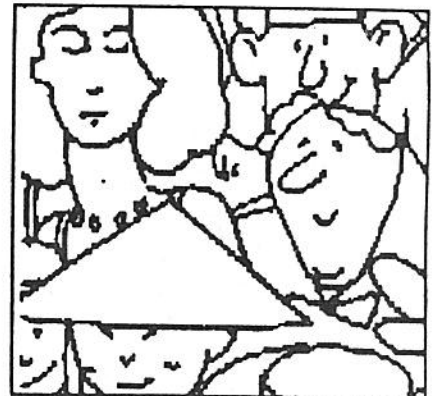
Richard Harris reported that the Strategic Planning Subcommittee had met since the last IRC meeting and had agreed on the need for a planning time line that would mesh with the overall university planning structure.

Paul Schlieve reported that he has been discussing with others on his committee a plan for the evaluation and development of an electronic mail system, and distributed a preliminary draft of their recommendations. It was reported that the Provost has taken on this project and it is hoped that plans can be formalized quickly since electronic mail is at a critical stage of development on campus.

In response to a request from the State Internal Auditors, Richard Harris asked that a task force be selected by the IRC to draft a formal computer security policy which could be recommended, approved and presented to the Auditors by the end of August, 1991. The following persons were recommended for membership on the task force: Steve Miller (Chair), Bill Buntain, Mark Elder, Wanda Mundy, Chuck Fuller and Arne Almquist. This task force was asked to make a report to the IRC at its next meeting on April 23, with a goal of voting on recommendation of an official policy at the IRC meeting on May 21.

Ray Vondran reported that he received a memorandum from the UNT Network Managers Group outlining that group's purpose and requesting that the IRC consider inclusion of their members in sub-committees appointed by the IRC. Arne Almquist

Please see IRC on page 19



BENCHMARKS FORUM

BENCHMARKS FORUM is intended to serve as a vehicle for answering questions that may be of general interest to the user community. If you have a question, please send electronic mail to the Benchmarks editor (BITNET: AS04@UNTVM1) or write it down and drop it by the Computing Center. We will try to answer it in the next issue.

Question: *I have been reading a lot lately about the health risks that come with using desktop computers. Since I don't use a microcomputer all the time, I was wondering if there were any tell-tale signs that I should watch for?*

Answer: The following information is taken from *Computers and Health—A Checklist* Prepared by Dr. William Somers (Indiana University School of Optometry), Dr. Mark Ciancone (Indiana University Health Center), Mark Sheehan (Indiana University Computing Services), and Lana Meadows (Human Resources Management), Indiana University, Bloomington. Modified by Mark Sheehan for the ACM SIGUCCS Computer Services Management Symposium, 1991.

Vision and VDT Use

If your response to any of the following is YES, you should consult an optometrist. Be sure to explain to him or her precisely what your work environ-

ment looks like, what your work habits are, and the timing and intensity of the vision complaint.

- ☐ Do you experience headache accompanying or following approximately 20-30 minutes of continuous VDT use?
- ☐ Do you experience eyestrain, a very tired or pulling sensation around the eyes, after 20-30 minutes of VDT use?
- ☐ Do you experience transient blurring of vision daily after using a VDT?
- ☐ Do the letters, numbers, or symbols on the VDT screen appear blurred or indistinct, even after you have adjusted the monitor?
- ☐ Do you frequently lose your place when looking at the hard copy from which you are working, when looking at the VDT screen, or when scanning from one to the other?
- ☐ Do you experience double vision at any time?
- ☐ Do you have a feeling of very dry or irritable eyes, especially after 20-30 minutes of VDT use?
- ☐ Do your eyes turn red after 20-30 minutes of VDT use?

If your response to any of the following is NO, your work area or computing equipment fail to meet one or more acknowledged ergonomic criteria. You may wish to discuss these matters with your supervisor and start building a healthier work environment for yourself and your coworkers.

The Monitor

- ☐ Are the VDT screen and keyboard detachable?
- ☐ Is the center of the screen four to five inches below eye level?
- ☐ Is the screen surface at least 24 inches from your torso?
- ☐ Can the screen swivel from side to side?
- ☐ Are adjacent workers at least 48 inches from the back, top, and sides of nearby VDTs?

- ☐ Is the screen height adjustable?
- ☐ Is the distance from the screen to the operator's eyes adjustable?
- ☐ Are the characters on the screen easily readable from a distance of 27-29 inches?
- ☐ Is the room lighting level comfortable and are sources of light positioned correctly?
- ☐ Has the surface of the screen been treated to reduce glare, or has a glare-reducing screen been added?

The Keyboard

- ☐ Is the keyboard heavy enough to stay in place when used, or has it been secured against unintentional movement?
- ☐ Is the keyboard one inch or less in thickness at the near edge? Is the home row no more than 1-1.5 inches above the table surface?
- ☐ Is there adequate feedback to indicate key activation (i.e., sound, touch)?
- ☐ Is the keyboard layout standard? Are the cursor and numeric keys separate?

The Desk and Other Work Surfaces

- ☐ Is there adequate space for all equipment?
- ☐ Is the table depth adequate to allow positioning of monitor and keyboard at preferred distances?
- ☐ Are document holders available to keep hard copy vertical?
- ☐ Are the heights of all working surfaces conducive to proper posture?
- ☐ Is there space for resting the wrists during keyboard use (wrist rests, armrests, table surface wrap-around)?
- ☐ Are the desk edges rounded?
- ☐ Is leg room conducive to good posture?
- ☐ Is the space under the work area free from obstructions that might interfere with posture shifts?

- ☐ Can the work area be comfortably used by both left- and right-handed operators?
- ☐ Are all resources required for the job (manuals, reference books, disks, supplies) within easy reach?

The Chair

- ☐ Does the chair backrest provide good, firm, comfortable support for the back?
- ☐ Does the chair backrest tilt independently of the seat?
- ☐ Can the position and angle of the backrest be adjusted?
- ☐ Is the tension of the backrest adjustable?
- ☐ Does the seatpan have a rounded front edge?
- ☐ Is the degree of seatpan tilt adjustable?
- ☐ Is the chair height adjustable? Is the range adequate?
- ☐ Can chair adjustments be made easily, without tools?
- ☐ Is the seat surface properly padded?
- ☐ Does the chair rest on a sturdy base (e.g., five rollers)?
- ☐ Are adjustable footrests available if needed?
- ☐ Does the chair have armrests? Are they positioned so as not to interfere with chair movement?
- ☐ Is the seatpan sized properly so that it supports the upper legs adequately, but does not press against the backs of the knees?

The Worker

- ☐ Do you (or other workers) appear to have a relaxed position at the computer?
- ☐ In the normal working position, does your head lean forward no more than approximately 20 degrees?
- ☐ Are your shoulders relaxed (not hunched)?
- ☐ Is your wrist position "neutral?"

General Information

- ☐ Are your elbows flexed at an angle of 90-100 degrees?
- ☐ Do your upper arms hang comfortably at your sides?
- ☐ Are frequently reached-for items at or below shoulder height?
- ☐ Are you sitting without a twist to the spine?
- ☐ Are you able to work comfortably at your computer without frequent posture changes?
- ☐ Can you choose, for variety, to use either hand to perform some tasks?
- ☐ Is the room temperature dependably in the 70-72 degree range?
- ☐ Does the room have good ventilation, with no drafts?
- ☐ Is a 10-15 minute break (for other productive work) allowed for each hour at the computer?
- ☐ Is the computer located in a "no smoking" area?

If your response to any of the following is YES, you should consult a physician. Be sure to explain to him or her precisely what your work environment looks like, what your work habits are, and the timing and intensity of the physical complaint.

- ☐ Do you regularly experience tingling, numbness, or pain in the fingers, hand, wrist, or forearm while you are working at the computer?
- ☐ Do you regularly experience pain in the hand, wrist, or forearm that begins several hours AFTER you stop working at the computer?
- ☐ Have you lost mobility in any part of your hand or wrist, or has that mobility become limited, since you began to work with the computer?
- ☐ Do the muscles in your neck, shoulders, or back become stiff or sore during or after a session with the computer?

Question: *Is there anything I can buy to help make my work environment more comfortable?*

Answer: Here are some products that might make things more pleasant for you:

- **General Fitness:** Stretching, Inc. has three products to help you with this: *Stretching*, \$10.95; *Exercise Guide*, \$3.95; and *Software*, \$10.95. Contact them at P.O. Box 767, Palmer Lake, CO 80133 (800-333-1307).
- **Wrist Help:**
 - *Daisy Wrist Rest I*, \$44.90 + Shipping & Handling. Daisy Wheel Ribbon Co. (714-989-5585; 800-266-5585).
 - *Wrist Pro*, \$19.95 + Shipping & Handling. (800-348-8638)
 - *Wristonics Comfort Pad*, \$14.95. Marcus Franklin & Associates, Anaheim Hills, CA (714-921-1810).
- **Vision Help:**
 - *Eye Relief PC*, \$130.00. SkiSoft, Lexington, MA (617-863-1876).
 - *Vision Aerobics*, \$129.00. Vision Aerobics, Inc., Red Bank, NJ (800-752-2257)
- **Noise:** *Noise Killer*, \$49.00. Scandec Development, 3001 Redhill Ave., Suite 217, Costa Mesa, CA 92626 ■

Benchmarks Reader/User feedback is encouraged. Send all letters, suggestions, etc to (AS04@ UNTVM1), FAX 817-565-4060 or to the Benchmarks Editor at:
Academic Computing Services
University of N. Texas Computing Center
P.O. Box 13495, Denton, Texas 76203



IRC continued from page 17

reported his group's concerns about further development of the current WordPerfect Office Mail system being used to link departments and suggested the consideration of alternate systems. Almquist asked that his group be involved anytime the IRC is dealing with communications issues.

Dave Molta brought up two new issues for consideration by the IRC:

- Support for different computing platforms across campus; for example, Macintosh and IBM OS/2.
- Maintenance of Macintosh computers.

Molta pointed out that in some cases the Computing Center supports software that runs on computers that are not supported by the Microcomputer Maintenance Shop, and vice versa, which is creating quite a problem for departments. He requested an update of the "Supported Items List," which was originally a part of the Computer Acquisition Policy developed by the IRC. Vondran stated that the policy and the list will be considered at the next IRC meeting. ■

The Chronicle of Higher Education to go "On-Line"

According to an article in the March 20, 1991 issue of *The Chronicle of Higher Education*, the full text of that publication will be available on the University of Southern California campus-wide computer network beginning Fall 1991.

This on-line service is part of a pilot research project undertaken by USC and *The Chronicle* to study the demand for on-line information on college campuses and how it might be used. ■

Save on Software

WordPerfect Offers \$100 Rebate

WordPerfect has a new School Software Program for 1991. Among the many features of the program is a \$100 rebate for *individual* purchase of WordPerfect, DrawPerfect, Plan Perfect and DataPerfect products. Faculty, staff, and full-time students qualify for this rebate. The rebate can only be received for the purchase of one copy of each product listed above.

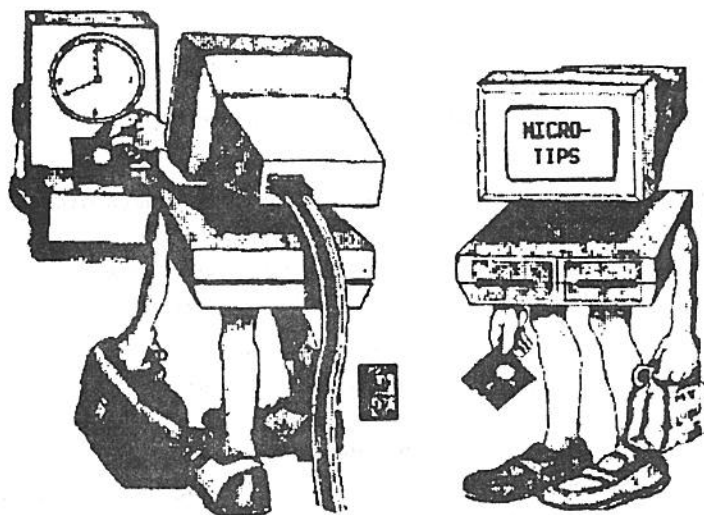
Authorized WordPerfect educational dealers have the appropriate forms for the free licenses or rebates. For more information about the School Software Program, call WordPerfect Corporation Education Information at (801) 222-2300.

Ventura Gives Price Break

Ventura Software Inc. has announced the reduction in price of its Ventura Publisher and FormBase 1.0 programs for educators, administrators, and students. These programs can now be purchased for \$199. Call 800-822-8221 for more information. ■

Do You Have an IBM PS/2 ?

IBM has been trying to get owners of certain 8513 displays, which come with IBM PS/2s, to "turn them in." According to an article in the March 1991 *Buffer*, the Newjournal of the University of Denver Computing Center, IBM issued its third Engineering Change Announcement (ECA) to large corporate users and dealers, offering them a free replacement unit for as long as four years after the date of purchase. Monitors with serial numbers ranging from 72-000000 through 72-064-000 are affected. ■



This column is intended to serve as a forum for sharing useful tips on making more productive use of microcomputers. If you have a tip that you feel may be of use to campus users, submit it to the Benchmarks editor for possible inclusion in a future issue.

EDUCOM/NCRIPTAL Higher Education Software Awards

Each year, NCRIPTAL (National Center for Research to Improve Postsecondary Teaching and Learning) and EDUCOM (a non-profit consortium of colleges and universities committed to the use of management of information technology in higher education) present awards to faculty members and developers for the best instructional computer software products or innovative instructional uses of existing software. The awards are divided into the (1) Product Division and (2) Curriculum Innovation Division. The Product Division covers the development of original instructional software such as tutorials, simulations, and educational tools. The Curriculum Innovation Division covers the classroom use of computers and existing software to solve educational problems. The winners for 1990 are:

Best Chemistry Software & Best Design: *SPECTRUM* (Signal Processing for Experimental Chemistry Teaching and Research/University of Maryland) — Thomas C. O'Haver (University of Maryland). (301-454-6128). Apple Macintosh series; price to be determined.

Best Engineering Software: *Hodgkin-Huxley* — Thomas F. Weiss, Giancarlo Trevisan, and David Huang (Massachusetts Institute of Technology) 617-253-2594. IBM RT Model 115, DEC MicroVAX 2, 2000 or 3100 workstations; price to be determined.

Best Humanities Software: *Art or Forgery? The Strange Case of Han Van Meegeren* — Preston Covey and Lisa Leizman (Carnegie-Mellon University) 412-268-7643. Price to be determined.

Weston Vernon Jr. NCAIR Award of Best Educational Software in Law: *CompuGraph v. Chang* — Daniel Burnstein and Jacquelyn Camp (Harvard Law School) 617-495-4840. IBM PC, XT, AT, PS/2 series; price to be determined.

Best Physics Software: *Microcomputer-Based Laboratory Tools Using a Lab Interface* — Ronald K. Thornton (Tufts University) and Priscilla W. Laws (Dickinson College) 503-297-5317. Apple Macintosh series; \$15.00 for software and manual; MacMotion,

MacTemp, and Event Counter, \$15.00 each; Data Logger and Event Timer are provided with the purchase of a universal lab interface (\$350.00).

Best Psychology Software: *PsychSim II: Interactive Graphic Simulation for Psychology* — Thomas E. Ludwig (Hope College) 212-475-6000. Apple II series, Macintosh series, IBM PC, XT, AT, PS/2 series; \$559.95 for a site license; \$259.95 for adopters of Myers' textbook *Psychology*.

Best Writing Software: *The Daedalus Instructional System* — Paul Taylor, Wayne Butler, Locke Carter, and Fred Kemp (The Daedalus Group, Inc.) 512-459-0637. IBM PC, XT, AT, PS/2 series with a network operating system; \$5,000 for site license for 30 stations.

Best Curriculum Innovation - Humanities: *Implementation of Intermedia in English Literature: A Dickens Web* — George Landow and the IRIS Intermedia Development Team (Brown University). Apple Macintosh IIx, IIfx running A/UX 1.1.1. Uses IRIS Intermedia 3.0 software (IRIS/Brown).

Best Curriculum Innovation - Large Class: *Anthropology 3: Multimedia Learning in Introductory Archaeology* — Brian M. Fagan and George Michaels (University of California - Santa Barbara). Apple Macintosh series. Uses Introductory Archaeology HyperCard exercises software (Brian Fagan).

Best Curriculum Innovation - Scientific Laboratory: *The Analytical Engine* — Stuart H. Hirshfield and Rick Decker (Hamilton College). Apple Macintosh series; uses the Analytical Engine 1.0 software (Wadsworth).

Accounting (NCAIR Distinguished): *IFSS (Interactive Financial Statement Simulation)* — Forrest W. Harlow, Jr. (Angelo State University) 915-942-0198. IBM PC, XT, AT, Jr, PS/2 series; \$25.00 for software and manual; \$200 for site license.

Archaeology: *An Introduction to the Study of Egyptian Hieroglyphs* — Allen J. Fletcher (University of Calgary) 403-239-9391. IBM PS/2 series Model 50; \$600 for software.

Astronomy: *Astro Labs* — John D. Trasco (University of Maryland) 301-454-8695. IBM PS/2 series Model 50; \$600 for software.

Economics: *Good Graphs!* — Tod S. Porter and Teresa M. Riley (Youngstown State University) 800-323-7437. IBM PC, XT, AT, PS/2 series; free to adopters of Dryden Press textbooks.

Best Curriculum Innovation - Engineering: *The Manufacturing System Development Game* — Peter L. Jackson, John A. Muckstadt (Cornell University) and John M. Jenner (IBM). IBM XT; uses LOTUS 1-2-3, Draw Plus, XA Professional Linear Programming System and XCELL+ Factory Modeling System.

Engineering: *Crystal* — Mark J. Franklin, Susan Schwarz, Andrew Rogertson, Paul Armann and Richard Jaenicke (Dartmouth College) 603-643-3546. IBM 6152, RT 6150 Models 125, 115, 135; price to be determined.

Engineering: *FEHT - A Finite Element Analysis Program* — S.A. Klein, W.A. Beckman, and G.E. Myers (University of Wisconsin-Madison) 608-836-8536. Apple Macintosh series; \$400; unrestricted site license for \$800.

Foreign Language (Japanese): *KanjiMaster* — Dezso Benedek, Clate Sanders, and Junko Majima (University of Georgia) 800-726-5037. Apple Macintosh series; \$149 for software and manual; site license \$1,500.

Journalism: *Bayshore Blast: A Reporting Simulation with Newswriting Analysis* — William E. Smith (Northeastern University) 919-684-6837. Apple Macintosh series; \$30 for software and manual, one-year site license \$300, other discounts available.

Journalism: *City Council* — Richard Cameron (West Valley College) 408-741-2043 or 408-335-2078. Apple Macintosh series; \$20 for software, annual and teacher's stack; first two copies \$20 each, additional copies are \$20 each, up to \$250 maximum.

Mathematics: *Analyzer 3.0* — Beverly West and Douglas Alfors (Cornell University) 607-255-7244. Apple Macintosh series; \$50 for software and manual, varying discounts for quantity orders, site licenses individually negotiable.

Curriculum Implementation - Physics: *Physics 294 - Laboratory in Electronic Instrumentation* — John W. Snider and Joseph Preist (Miami University). Apple II + or IIe; uses Electronics for Physics Experiments (Addison-Wesley).

Psychology: *Experiments in Cognitive Psychology* — Barbara Tversky (Stanford University). Apple Macintosh series; \$400 for site license. ■

Duke University Press to Close, All Software 50% Off

By Paul Baerman, Duke University Press
(DBOOKS@DUKEMVS)

This message was posted to the Academic Software List (ACSOFT-L@WUVM).

Duke University Press has announced the imminent closure of its software publishing division, National Collegiate Software. Several dozen DOS-based and MAC-based software titles are on the block, and there will be a final closeout sale effective May 1st: all titles are 50% off retail, even for site licenses. (Duke's "normal" educational discount is 20%). After June 1st no orders or returns will be accepted.

This may be the last chance to order this software at any price. The portfolio, which is centered on faculty-authored liberal arts applications for teaching and research, is particularly strong in research methods and statistics for the non-scientist, with a few very nice titles for qualitative analysis, sociology, political science, economics, and English.

An ASCII catalog and order form are available via BITNET: send a note with the subject "SOFTWARE CATALOG" to DBOOKS@DUKEMVS. ■

DID YOU KNOW?

Former Massachusetts Governor Michael Dukakis is the only political figure to have a virus named for him. In 1988, a Florida teenager wrote a virus that infected Hypercard stacks — the screen would flash "Dukakis in '88." Neither Dukakis nor his campaign were connected with the teenager.

VAXCLUSTER USAGE STATISTICS

March Top Ten Programs: CPU Time Used

Program	Description	CPU Time	Percent of Total
1. User programs	Compiled Programs	15 01:02:20.73	69.2
2. NEWS	ANU News Utility	1 11:15:43.05	6.8
3. DISKEEPER	Disk Optimizer	0 18:19:40.45	3.5
4. XZZZY	Chat Utility	0 13:10:14.72	2.5
5. BACKUP	Disk Backups	0 10:16:50.54	2.0
6. NNTP_TCPWIN	News Transfer Utility	0 10:05:06.63	1.9
7. MAIL_SERVER	VMS Mail Server	0 07:47:32.98	1.5
8. MAIL	VMS Mail	0 07:02:47.38	1.4
9. LOGINOUT	User Login	0 06:22:45.85	1.2
10. EDT	Editor	0 06:11:22.17	1.2
Total		21 17:38:56.16	

March Top Ten Programs: Frequency of Runs

Program	Description	Number of Runs	Percent of Total
1. LOGINOUT	User login	104665	21.5
2. SET	VMS Utility	63799	13.1
3. DIRECTORY	VMS Utility	45381	9.3
4. DELETE	VMS Utility	42250	8.7
5. User programs	Compiled Programs	32244	6.6
6. SEND	BITNET message Utility	24109	5.0
7. MAIL_SERVER	VMS Mail Server	22868	4.7
8. SYSLOGIN	User Login	15815	3.2
9. MAIL	VMS Mail Utility	11503	2.4
10. EDT	Editor	10360	2.1
Total		486870	

Solbourne Update

by Billy Barron, VAX/Unix Systems Manager (billy@untvax, billy@vaxb.acs.unt.edu)

On April 1st, the Solbourne became available to the UNT general user public. So far we have been pleased with the overall performance of the machine. According to some benchmarking, at the time I'm writing this the Solbourne is the most powerful machine on campus in terms of raw CPU performance (other systems, such as the HDS mainframes, are more powerful in terms of I/O).

However, the research community of UNT has already managed to keep the Solbourne quite busy both in terms of CPU and disk space usage. On the positive

Please see SOL on page 23

The Best of the BBS



Edited by Ken Corey,
VAX Programmer/
Operator (BITNET: KENC
@UNTVAX)

Welcome to the **Best of the BBS** column. This column highlights some of the more interesting and useful discussions on the UNT BBS. For those of you not familiar with the BBS, here is how to log into the UNT BBS.

- Sign-on by typing **CALL DEC** at the LAN prompt and then entering **BBS** as your Username at the VAX prompt.
- If you are already logged-on to the VAXcluster, type **BBS** at the \$ prompt.

The opinions expressed in this column do not necessarily reflect the views of Academic Computing Services or the Computing Center. Also, information in **Best of the BBS** has not been checked for accuracy.

AMIGA

#1797 6-MAR-1991 18:38:24.12

Subject: Communication

Just a note to say I'm using A-Talk III on my 2500 and it seems to do a credible job so far. It's structured like Pro-comm to a degree and even supports voice synthesis for message reception. Anyway, the best price on it that I found was at Hard Ware-House in the Mid-Cities. They are the only true Amiga discounter I can find for hundreds of miles.

#1838 Reply to #1797 10-MAR-1991 22:27:04.75

Subject: RE: Communication

I've wanted to buy A-Talk III one time because it was on special. However, I didn't because it can't handle more than 8 colors. That's why I use JRcomm. It can handle 16 colors and is cheaper (shareware). However, I've never found the "perfect" telecomm program for the Amiga...there is

always something more the programmer can do to improve a telecomm program. For example, JRcomm has a VT100 mode but it doesn't have a kermit protocol.

You are right about software discount stores. My best advise is to shop around. However, I'm sure most stores do there best to sell the products at the lowest price they can.

Communications

#1900 14-MAR-1991 23:45:13.26

Subject : Cellular Modeming

Cellular Modeming I mean connecting my modem to my cellular phone and telecommunicating.

Is that practical, and can I do it? It would be great if I could. Any of you 'old' timers out there let me know. ((Like LClarkin, perhaps?))

#1903 Reply to #1900 15-MAR-1991 13:14:04.36

Subject : RE: Cellular Modeming

Well, given the current state of Cellular technology, the best throughput you can get on a GOOD cellular line is ~300 baud (max). For most of the stuff that's floating through Denton and Dallas, you might be lucky to break 100 baud. Some companies

are pushing cellular modems, and when the technology is perfected (as if that ever happens in the computer world (sigh)), it will be damned convenient. But until then, get a dedicated phone line. It's more efficient. :-)

#2051 27-MAR-1991 15:06:25.86

Subject : Using FTP

I finally got into "MARS.EE.MSSTATE.EDU" and went to read all directories and subareas in their BBS. It is wonderful! They have a sub are called IBM.WIN3 ... Ya, it contains (I think) great programs for MS-Windows 3.0

Problem: You Can't download any thing from their BBS!!!!!! Options od Downloading protocols are available like:

- 0) Kermit
- 1) Ymodem
- 2) Xmodem
- 3) Zmodem

I tried all of the above, but An error happen !!!!! and the file get cut off. Will some body help me and tell me how to use FTP to down load these files.

#2057 Reply to #2051 27-MAR-1991 17:08:18.26

Subject : RE: Using FTP

I'm no sysop but I'll answer your question the best I can. I don't know if you have a UNIX or a VMS or whatever account. I assume that what I tell you will work.

1.) if you are on a system that has disk quotas or the file system is close to being full make sure that you have enough disk space to hold all of the files that you wish to ftp.

2.) type 'ftp mars.ee.msstate.edu' when you get the prompt to log in type 'anonymous' when the password prompt appears type your actual login name. If all goes well you will be at the 'ftp' prompt. If you are getting archives, data files, executables, or other binary files type 'bin' so that it will know the file type. Not all commands work the same on all systems especially to change directories so it may take some experimentation to find what you want. Now simply type 'get filename' to get the files sent to your directory. When you are done type 'bye' to close the connection. Now you have your files on your VMS or UNIX account not on your pc as you probably want. At this point I usually use a pc with an ethernet card so that I can quickly transfer the files to disketts. If you must you can use kermit as well but if you have megabytes of files be prepared to wait. To speed up kermit you can set you packet size and window size to larger values. However (packet size) * (window size) must be smaller than or equal to 2000. I just checked out mars.ee.msstate.edu and it seems pretty good. Well, I hope that I helped.

#2215 Reply to #2214 11-APR-1991 01:48:32.53

Subject : BBSES in Denton

Someone was wondering if there were any BBSES left in Denton? First of all computer currents is completely wrong. Some #'s are:

Lighthouse BBS 381-1024

Big Book BBS 387-5155

Moose's Den 381-7905

Big Book 387-5155

Colossus 387-1426

Texas Country II 898-0988

Light House 381-1024

Moose's Den 381-7905

Shadow's Realm 387-7471

Dorm Room 565-6185

Shadow's Realm and Dorm Room are Part Time boards.. Shadows Realm is on from around 9am til about 11pm. (Check BBS for accurate times).. Dorm Room is on from around 9pm til 9am - Sunday thru Thursday.. again check that BBS for accurate times..

SOL continued from page 22

side, some of these early Solbourne users should be getting their own workstations in the near future and Academic Computing Services hopes to be able to purchase some more processors and disk for the Solbourne during the next fiscal year.

A few comments about some software packages that have been installed:

- **SAS** — See the related SAS article elsewhere in this issue.
- **C** — The Sun C (cc) compiler is not ANSI standard (K&R version 2). It is based on K&R version 1. We have also installed Gnu C (gcc) which is ANSI standard, but it is also a public domain product which means that we have little or no support available for it.
- **nu/TPU** — nu/TPU is the Unix version of the VAX TPU editor. This is the recommended editor for novice Unix users and veteran VAX users. However, it is not recommended for people who will be using other Unix systems in the future because TPU is installed on a minority of Unix systems, whereas the vi editor is on almost every Unix system in existence.
- **Emacs** — The GNU Emacs editor is available. However, please note that it is an unsupported piece of software.

An *Introduction to Unix* handout is now available in ISB 119. It is free for the asking.

Any Solbourne support questions should be directed to the VAX/Unix Operators. They can be contacted by sending mail to the "operator" account or by calling 565-4161. ■

#2296 23-APR-1991 13:53:51.91

Subject: PROCOMM BUG ?

Hey all you BBS'ers! Does anyone know why a mouse might interfere with the operation of Procomm 2.42? I'm running an XT clone with 640K RAM, 20M HD, & 2400 baud external modem. After I installed a Logitech mouse on the system, Procomm would not load the dialing directory. When I removed the mouse driver (MOUSE.COM) from RAM, normal operation was restored. I'm completely baffled, and would appreciate any help.

#2298 Reply to #2296 23-APR-1991 16:40:10.38

Subject: RE: PROCOMM BUG ?

Sounds like an IRQ conflict. Check what IRQ your modem is set on, and then your mouse. IRQ is the computer's interrupt.... sometimes you can switch em to different ones.

#2297 23-APR-1991 14:01:27.76

Subject: File Transfer on SEQUENT

Does anyone know the procedure for uploading/downloading files between a PC and the SEQUENT over a dialup line? I'm working on a "C" program for CSC15040, and it's a real pain to get to the lab (I work 2nd shift at TI in Lewisville). Help, Help, Help !!!

P.S. - Where can I get documentation on the vi (very inefficient?) editor?

#2309 Reply to #2297 24-APR-1991 11:05:03.78

Subject: RE: File Transfer on SEQUENT

If you are familiar with using KERMIT on the VAX, you should be able to work KERMIT on the Sequent. Remember to change your line settings on your modem to 7-E-1 or 7-Space-1 and to set PARITY in KERMIT to match.

If you have other questions, leave another note or send me email.

#2321 Reply to #2297 24-APR-1991 18:47:36.45

Subject: RE: File Transfer on SEQUENT

The trick to using kermit is to get the line settings, the kermit program on your side, and the kermit program on the other side to all agree on the same settings. When the 3 settings all agree kermit is a very robust protocol. btw, Procomm seems to not do so well with the kermit protocol for some reason. MSKERMIT is better for transfers and also has a more accurate vt100 emula-

tion. Once you get kermit to work you can start changing the packet and window sizes to get respectable if not stellar throughput.

vi is actually a very nice editor for making small changes to your programs. The beauty of vi is that the types of operations that programmers do frequently can be accomplished in relatively few key strokes. Going to line numbers, deleting lines, moving lines, searching for strings all require only a few key strokes. vi is not very intuitive for most people so it is a source of nightmares for beginners. Another bonus is that with vi your fingers never have to leave home position to hit function keys. Everything is available from the keyboard. If you want a better editor you can move to the Rolls Royce of editors GNU EMACS. Emacs has every feature and bell and whistle you can think of as well as about 1000 more built into it. You can even read the news and send mail from emacs. I've even heard of people putting emacs in their .login or .profile and doing their whole session using emacs as a sort of shell.

IBM PC

#1820 9-MAR-1991 14:02:59.81

Subject: Help with serial port redirection.

Can one of the MSDOS hackers around here help me with this problem? My life would be made much easier if I had a program that redirected anything that is sent to the serial port to a file. Don't jump too quickly, it gets worse, the program that I wish to use it with probably accesses the UART directly instead of using the BIOS interrupt. Also the program that I want it to work with is not very well behaved and does not like most TSR's.

If anyone can solve this problem for me I would be grateful.

#1841 11-MAR-1991 17:35:24.71

Subject: arc

I'm not sure if this is the right place to ask, but I am getting frantic (well, maybe just annoyed) and everyone seems to be on Spring Break. How does one de-arc files on a 286 machine using ms-dos 4.01? I realized I had a problem with this when I first tried to install ProComm, obtained from ISB 110. The read.me file said to type "arc" and some other stuff, which, when I typed it, gave me "bad command or file name" every time.

Someone said I had to use a utility program and suggested getting pkxarc.com from the UNT BBS. I did. Following the instructions in pkxarc.doc, the drive containing

pkxarc.com will light up for less than a second, then the prompt comes back. I don't see anything else happening. (I finally gave up on the arc aspects and just copied the de-compressed version of ProComm from someone else who also couldn't get arc to work either.)

Anyway, the vaccine programs in the BBS are all arc'ed and I don't have a clue how to get to them. I've also tried pkunzip on some .zip files which only seems to take the prompt away for a long time (long enough that I rebooted.)

And another thing: how does one uen-code files using a pc instead of Unix? Isn't this needed to use files obtained from the comp.binaries groups in ANU News?

Can someone help? Am I just being dense, or is shareware something where you get what you pay for? At this point, I don't mind buying a REAL program if it came with REAL documentation and REALLY worked, although I don't know which one to buy. Thanks to anyone with any advice.

#1843 Reply to #1841 11-MAR-1991 18:12:10.96

Subject: RE: arc

The processor and dos version shouldn't make any difference when arcing/unarcing stuff. My utility is pkxarc.exe, not .com, but I don't know if that would make much difference. The PK arc and zip stuff really does work. The command would go something like 'pkxarc file.arc', and it should work, if the version of the arcing utility works right. Good luck.

#1857 Reply to #1841 11-MAR-1991 23:36:04.12

Subject: RE: arc

I got a compressed version of Procomm Plus from room 224 in the ISB building back in December '90. The people there were friendly and helpful and also provided a one page handout that gave directions for installing the program. The program gave you the option of installing to a hard disk or a floppy, and also included an automatic decompression utility. It was some form of PKZip if I remember correctly. The program then ran on the first try on a 286 w/MSDOS 4.00, although in black and white. By copying the program (installing) to floppies you can run the install that is shipped by Datastorm and set the program up any way you want. The only thing that room 224 required was a formatted floppy they could copy the program on to, the file decompression and installation was automatic.

The Nov/Dec '90 issue of *Benchmarks* has the details of the offer if it is available. Also, an excellent commercial (read competent) utility that will handle the ARC and ZIP formats, as well as performing many other amazing chores, is XTREE GOLD ver. 2.0. I think it's a great program. I hope you get Procomm working, it's the only worthwhile program I've gotten from U.N.T., I see it as a return on all those micro user fees...

#1858 Reply to #1841 12-MAR-1991 00:57:23.76

Subject: RE: arc

Knowing that this message will have thousands of replies before I really read all the replies..I will go ahead and reply anyway. IF you have a hard drive copy pkxarc.com to the directory that contains the file with the .arc extension. At this point just type pkxarc file.arc where file is the file you want de-arc'd. I just copy the de-archivers to a utility directory in my hard drive were I have the path set to...then I can de-arc from any directory to any directory. If you have a floppy system, then space conflicts may arise when you de-arc something.

#1865 Reply to #1841 12-MAR-1991 22:51:28.36

Subject: RE: arc

Does the file you received end in EXE? If it does then the file is probably self-unarcing. To make the file unarc all you need to do is type the name of the file. Most of the files on the BBS end in either ARC or EXE. The files that end in EXE are usually self-unarcing. The ones that end in ARC (or ZIP or ZOO) must be unpacked by the appropriate utility. The last copy of Procomm that I picked up at the help desk was self-unarcing although the instructions still said to run the PKXARC utility on the file. (It took me a while to figure out that the instructions were wrong. I should have stood by the old adage "Read the instructions only when all else fails!") BTW, some of the self-unarcing files on the BBS are collections of ARCD files so you may have layers of unarcing to do. (The McAfee virus scan program is an example of this.)

#1866 Reply to #1841 12-MAR-1991 23:02:06.52

Subject: RE: arc

I forgot to mention that you need to make sure that when you download files from the BBS esp if they are ARCD in ANY manner you use the Binary transfer protocol. If you download them with the ASCII or TEXT

protocols they will not Unarc properly if at all. If you are downloading with procomm check altS Kermit setup (number 3) file transfer type. Make sure that is set to Binary. The BBS is set to Binary automatically. BBS Gurus, please correct me if I'm wrong on that one.

#1871 13-MAR-1991 13:29:59.82

Subject: arc

Thanks to everyone who responded to my plea for help. I had already tried all the suggestions, with absolutely no luck, when I figured out my mistake. Apparently, when I set my kermit file type to binary, I didn't save the change, so I had downloaded text files. I changed to binary, downloaded again, and got results. Everything is working fine now, and boy, do I feel stupid.

I believe the Procomm trouble was due to faulty documentation, although I have erased that disk, so I'll never know for sure.

Now, I have another question. The new metro lines at UT Arlington use 7 bit word length, SPACE parity, 1 stop bit, and full duplex. This isn't the same as the BBS downloading requirements, is it? If I use the new lines to get onto the BBS through VAX, will I still be able to download? Just wondering.

MAC

#2204 9-APR-1991 09:54:58.42

Subject: background or desktop pictures

howdy all, I recently went color with a IISI. Unfortunately, "backdrop", an init that displays screens in the background, doesn't like the color startup screen format. Does anyone know of a program that will randomly display startup screens, and then keep them on the desktop? I have some cool fractal images to try out.

#2232 Reply to #2204 13-APR-1991 16:54:40.08

Subject: RE: background or desktop pictures

'allo, 'allo!

DeskPict will put color PICT as your desktop. I don't think it do startup screen (somebody please correct) but if you use the same picture for startup screen and desktop it should do the trick. I used it for a while and then throw it away because (a) your picture has to be mapped to system palette which will most likely (95%) ruin your picture, (b) it needed and reserved 300KB of your precious RAM to keep the PICT in memory. So if (a) your picture is

not using system palette, it will be remapped for you, and (b) not enough memory, no desktop picture. This remapped thingy also occur to your startup screen.

Later on, another init come out, I believed it is called "Thor's init" and another one called "RGB Palette" or simillar. (Please insert the correct name(s) if it was wrong. Hey! It's been awhile, ok? 8^) It forced your system to use its palette and/or palette in the picture. Make startup screen and desktop picture looks good but (yes, but) it also screw up (can I say it here Eric, Billy?) other program. The paint/pict color program sometimes get confuse and use the wrong palette..... Still, nothing reduces the 300KB thing.

Now (no pun intended) DeskPict is included in Now Utilities which is commercial product. \$100+ I think. Never saw it in action so no comment from here. Maybe other knows.

I use "Big Pat" in conjunction with "Pik-a-Pat". They let you edit and save different patterns ala the pattern thingy in the General cdev from 2x2, 4x4, 8x8 (system pattern), 16x16, and 32x32 grid. Only 8 colors allows (same as General) and works very well with 24-bit color mode. It replaced the system default pattern so no RAM is reserved (sort of).

If you have FTP access, you can find them (except the Now Utilities, of course) at Info-mac and I think the RGB thing is bundled with DeskPict. 'anonymous' FTP to sumex-aim.stanford.edu and they should be in /info-mac/init directory.

PROGRAMMING

#2142 Reply to #1552 1-APR-1991 16:39:01.58

Subject: RE: COHERENT

I know I'm kind of late in this reply, but I am very interested in Coherent. I ordered a copy of it back when it was first released, and upon receipt realized that it did not support SCSI drives AT ALL (the MWS guy assured me that any PC drive would work fine...they have since modified that statement;) so I had to send it back. I've just installed an IDE setup, and the people at MWS have claimed that it'll work fine on most systems with these BIOS (AMI) and IDE, so I'm considering it again.

What do you think of it? The manual seemed OK, if a bit scant in places. I never actually got to see it run. Have you tried setting it up to let someone call in on your modem and work from remote? I would be very interested in discussing it with you.

#2161 Reply to #2142 2-APR-1991 21:18:15.59

Subject: COHERENT 3.1

I have been running Coherent 3.1 on my Swan 286/12 for quite a while now. It is a very good Unix clone, but with some interesting restrictions and omissions. From a programmers viewpoint, a major restriction is that only the small memory model is supported and the C compiler does not support the coprocessor. The software floating point representation is (according to MW tech support) not the IEEE format used by the coprocessor, but is instead the VAX F- and D floating point representation! The compiler itself is a port of the MW Let's C compiler which sank out of sight in the MS-DOS market a few years ago. The assembler does support the coprocessor. I have not attempted to look at code generated by the compiler to see if the tech support info is correct.

One very noticeable omission from the suite of utilities is the "more" command. Something called "scat" is used instead. I was sufficiently annoyed by this that I wrote a "favorite parts" subset of the "more" utility. I will make this available if there is enough interest. It's easy to write your own.

The latest release (3.1) has a clone of the vi editor. It also supplies micro-EMACS (with source). There is also limited SCSI support, for the Adaptec AHA-154x series SCSI controllers. There is also better support for IDE drives. The UUCP works fine. I have used it to communicate with the MW bbs, which has software updates for COHERENT as well as PD software. I have downloaded their bulletin which explains how to install COHERENT on IDE drives.

In the near future, there will be a large-memory-model release of COHERENT which will require a 386. The 286 large memory version will be later, if it happens at all. The tech support person said that if the 286 implementation became too difficult that it would probably be abandoned. Don't hold your breath waiting for it. The 386 version will *not* be binary-compatible with any other Unix implementation; forget about running software compiled for SCO or Interactive versions of Unix.

I have not explored COHERENT in great detail yet. I don't know UNIX well enough to spot minor differences between ATT or BSD and COHERENT. I have been play-

New Computer Access Metro Lines Go Production

By Dr. Philip Baczewski, Academic Mainframe User Services Manager (BITNET: AC12@UNTM1)

On May 12 1991, the eleven metro lines available on telephone numbers 429-6006 and 429-9314 will be removed from service and permanently replaced by the sixteen newer and more reliable lines installed at UT Arlington for UNT use. The new phone number is (817) 792-4140 and it answers on the third ring. As first announced in the February 1991 issue of *Benchmarks*, the lines support from 300 up to 2400 baud modems including MNP Class 5. However, you must use 7 data bits, SPACE Parity, 1 stop bit, and FULL duplex to access these lines. When you call the number, rather than the usual pound sign (#), you will see a **UNTModems>** prompt.

To connect to host systems, the following commands are used from the **UNTModems>** prompt (the word **Connect** can be abbreviated as **C**):

Acad Mainframe (MUSIC, CMS, Acad COM-LETE)	Connect VM3270	or
	Connect CMS	or
	Connect MUSIC	
Acad Mainframe, Line Mode (8040)	Not available	
VAXcluster	Connect DEC	or
	Connect VAX	
Sequent/Ponder (CSCI dept)	Connect Ponder	or
	Connect Sequent	
Library On-line Catalog	Connect Library	or
	Connect Lib	
Solo (CSCI dept)	Connect Solo	
Any other TCP/IP host at UNT	Connect "ip address"	or
	Connect "hostname"	

On these new metro lines, the equivalent of the old <ESCAPE><RETURN> command is CTRL-^ (<CTRL><SHIFT><6>). To close a session, you use the DISCONNECT command from the **UNTModems>** prompt.

Problem reports should be made by calling (817) 565-2324 and placing a trouble call report (non-emergency calls placed after hours will be handled the next working day). Please make sure to report any problems with the new dial-up system. ■

ing with lex and yacc which are fairly well documented. The nroff and its man macro package will choke on some man macro invocations intended for real Unix troff, the

flex documentation being an example. flex itself will not compile properly.

I encourage you to get COHERENT. It is cheap and the technical support is good. ■

SAS Now Available on Solbourne

By Panu Sittiwong, Academic Computing Consultant (BITNET: PANU@UNTVMI)

Academic Computing Services has installed SAS for UNIX on the Solbourne as a test product. If all goes well, we will proceed to have SAS available on a production basis during the 1992 Spring Semester break. SAS UNIX is the full implementation of all the available SAS modules. It includes modules which are not available at UNT on CMS, MVS, or PC. The following modules are available:

AF	Application Facilities allow you to create a customized front-end for SAS programs for non-programmers.
FSP	A full screen product which allows you to create, view, edit SAS data sets in a full screen customized layout.
ETS	Contains all Econometric and Time Series analysis procedures.
GRAPH	A high resolution Graphic application capable of producing a variety of graphs from simple bar graphs to three-dimensional graphs and maps. There are also various map data sets available. The maps data set are stored as a SAS data set in the /usr/lib/sas/maps directory.
IML	Matrix language procedures.
OR	Operational Research procedures.
QC	Statistical Quality Control procedures.
STAT	Contains all major statistical procedures.

Running SAS on the Solbourne

SAS under UNIX can be executed in either Interactive or Batch modes. Batch processing requires that you create a SAS command file using the editor and submit it to SAS for execution. Interactive execution takes advantages of a relatively new feature of the SAS system called "Display Manager." Academic Computing Services encourages you to take advantage of this new feature rather than running a Batch job.

Batch Processing

As mentioned above, Batch processing requires that you create a SAS command file and submit it to SAS for execution. The SAS command file that is created can have any filename but it must have a extension of .sas (remember UNIX is case-sensitive, so the extension must be lower case). This file will contain all SAS statements necessary to complete the job. To execute SAS in Batch mode, issue the command: **SAS filename**

Where: **filename** is the name of the SAS program with the extension of .sas.

After the program is executed, SAS will produce two separate files in your directory. Both of these new files have the same filename as the program file with the extension of .log or .lst. The former contains the SAS program commands, notes error messages if any. The latter contains all the output generated by SAS procedure.

Interactive SAS and Display Manager System

Interactive SAS utilizes fullscreen capability and special keys. In this environment, your screen is divided into several small windows which make up the SAS Display Manager System(DMS).

To start SAS using Display Manager System, enter the command: **sas**

SAS DMS consists of four primary windows and numerous secondary windows. The primary windows are as follows:

- Program Editor
- Log
- Output
- Output Manager

In this environment the following numeric keypads were pre-defined.

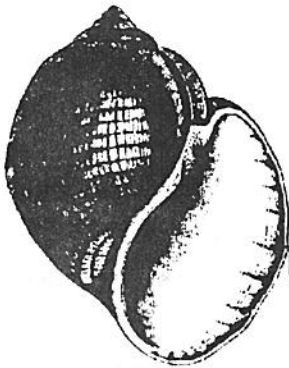
Keypad 2	Down Arrow
Keypad 3	Down Page
Keypad 4	Left Arrow
Keypad 6	Right Arrow
Keypad 7	Home
Keypad 8	Up Arrow
Keypad 9	Up page

Currently, the Academic Computing Services staff are preparing an Introductory Guide for SAS/UNIX. We expect to have it available by the first Summer Session. It will be available, along with other documentation produced by Academic Computing, from the Computing Center main office (ISB-119) or from the ISB-110 lab. ■

Using TPU Within elm

The nu/TPU editor works almost identically to the VAX TPU editor. It is HIGHLY recommended for users who are not accustomed to vi or emacs and will not be using other Unix platforms.

Within the o)ptions menu of elm, you can select TPU as your Elm editor. Just enter /usr/local/bin/tpu for the editor filename. However, when you need to exit TPU from within Elm, you MUST use <PF4> and then EXIT. If you try to save by hitting <CTRL><Z>, your session will be locked up and the mail message lost. The problem is being investigated. Please note that the only time this problem occurs is invoking TPU from within Elm. ■



The UNIX Shell

By Marc St.-Gil, UNIX Systems Programmer (mstgil@sol.acs.unt.edu)

Hello! And welcome back to *The UNIX Shell*. This month's column is a short note about using **nn**, Sol's news reading program.

The **nn** program is currently installed on Sol as a remote news reader. This means that the news files you are reading are not actually located on Sol. They are, in fact, located on Solo, a computer managed by the Computer Sciences Department. We plan to move the central campus news feed from Computer Sciences to Academic Computing Services. This should relieve Computer Sciences of some of the unnecessary headaches of maintaining a USENET news server. When the switch is made, you should not see any noticeable changes other than a speed increase.

nn not like any other news reading utility in use on this campus. However, it is somewhat similar to the ANU news reader available on the VAX. Some of you may already be familiar with it since it is currently available on Ponder, Computer Sciences' Sequent Computer.

When you first begin with **nn**, there are a few tips that will help you figure out what is happening. The key that you will use most is the space bar. The

default action is always triggered by the space bar. When you are in the selection menu, you enter the character next to the news item you want to read to select it. That news item will become highlighted to confirm your selection. Entering the character a second time will un-select the item. When you have selected all the news items that you want to read on that page of the menu, use the space bar to advance to the next page. At the bottom of the menu is a status line which has an indicator, at the right, that tells you what percent of the list of news items is still left for this news group. This indicator will also show you when you are on the last page of the list (BOT). Now that you have selected all the news articles that you want to read, press the space bar again to begin reading the items you selected. The reason that 'nn' is written this way is that it allows you to read just the news you want to read and do so with very few keystrokes other than the space bar. The status line at the bottom of the display always shows you how to get help for that specific menu.

For those of you with signature files, be warned that **nn** will not use any lines after the fourth line. If your signature file contains more than four lines, you will be notified via e-mail that you posting failed. This is not actually correct. The post succeeded, but your signature file was truncated. Please do not repost the message, simply edit your signature file to trim it down to the USENET approved size.

There are many other features available in **nn**. For more information on using **nn**, enter the **man nn** command. The Usenet news group **news.software.nn** also has interesting information. A handout on using **nn** will be available soon in the Computing Center (ISB 119). Be sure to check for it. ■

VAX/UNIX News

- **COMPRESS/UNCOMPRESS** utilities now available on the VAX — VMS versions of the UNIX utilities **compress** and **uncompress** have been installed on the VAX. For more information, see **HELP COMPRESS** or **HELP UNCOMPRESS**. Please report ANY oddities, bugs, or slight problems with these utilities to **OPERATOR** via MAIL.
- **Questions and Disk Quota Increases on the Solbourne** — All questions should be directed to the UNIX/VAX Operators instead of the full-time system personnel. The Operators are capable of answering most Solbourne questions and will forward the question to the appropriate staff member if they are not able to handle. In addition, the operators will answer questions in a much more timely fashion. Also, all disk quota requests should be directed to the operators. To contact the operators, either send mail to **operator** or call 565-4161.
- **Backspace vs. Delete** — A number of users have asked how to configure their Solbourne accounts to use delete instead of backspace (the default). To do this, edit the file **.login** in your home directory and add a line at the bottom as follows:
stty erase ^?

The **^** in front of the **?** above is the caret character (**<SHIFT><6>**). For more information on what can be done with the **stty** command, enter **man stty**.

- **Named user accounts now available** — The Solbourne facility for creating named user accounts is now available. Users wishing to obtain a named individual account may now apply by filling out a form which can be obtained in the Computing Center Office, ISB 119. ■

Shifting Workload from Mainframes to LANs Using Natural Connection and Clipper

By Bill Buntain, Payroll/Personnel Data Systems Team Leader

This is the text of the award winning presentation given by Bill Buntain at the Seventh Annual CAUCUS Conference of Software AG users in Dallas, April 21-24.

Background

The Payroll/Personnel Data Systems (PPDS) Team at the University of North Texas supports the payroll, personnel, and budgeting functions of the university and of the Texas College of Osteopathic Medicine (TCOM) in Fort Worth. Beginning in 1986, the PPDS Team began the development of the Human Resource Management Information System (HRMIS), a mainframe/ADABAS-based system written primarily in NATURAL and COBOL. For the past three years the PPDS Team has been exploring ways to shift workload from the university's administrative mainframe to local area networks (LANs). This effort has been precipitated by a number of factors, including:

- **Increasing demand from users for information** — The university and TCOM constantly receive requests for information from outside agencies. These requests often are in a form that does not match any existing reports generated by the mainframe-based system. As a result, they either require additional programming support or must be compiled manually. In addition, ad hoc, one-time requests generated internally take many man-hours per year to compile, using valuable resources in both the PPDS Team and the user departments.
- **Limited mainframe resources** — The administrative mainframe is heavily loaded with applications. An extensive ad hoc report generation system built for the mainframe or use of a generalized ad hoc reporting tool such as SuperNatural would be extremely I/O intensive and would not, therefore, be practical. For the same reason, building a PC-based front-end (such as HyperCard or TransPortal Pro) operating on mainframe data via screen buffer capture would also not be acceptable as it would add a significant additional load to the administrative mainframe.
- **Limited staffing resources** — Because of a fiscal crunch at the state level, the university has had to do increasingly more with limited resources. The PPDS Team has been staffed up for redevelopment of the Payroll/Personnel system, but is expected to decrease in size when the redevelopment is complete. Also, the departments have looked to computerization of functions, because of the limitations they face in increasing staff.
- **File complexity** — The complexity of the file design in HRMIS precludes all but the most sophisticated users using either NATURAL or SuperNatural for accessing the data.
- **PC tools functionality** — The PPDS Team recognized that PC tools have significant advantages in functionality and flexibility in building an ad hoc reporting/inquiry system.
- **Availability of Mainframe/LAN data porting tools** — The Computing Center at UNT supports the use of Natural Connection for moving data between PC-based systems and the administrative mainframe.

- **Development of administrative LANs** — TCOM has installed a campus-wide IBM Token Ring LAN running Novell networking software. UNT has several departmental LANs joined together in various configurations using the Novell networking software.

Alternatives

The PPDS Team has been pursuing several alternate strategies for offloading work from the mainframes to LAN's. Among these are:

- **Cooperative processing;**
- **Electronic forms;**
- **Automated signaturing;**
- **Downsizing applications;**
- **Shifting development of mainframe applications to compatible PC platforms (NATURAL OS/2, MicroFocus COBOL); and**
- **PC-based inquiry systems into data downloaded from the mainframe.**

Basically we feel that the technology to implement the first three has not yet matured into top-quality, stable tools and so have been pursuing the latter two approaches.

This paper is particularly concerned with PC-based inquiry systems. When making estimates of transaction volumes on mainframe systems, the most easily measureable counts are the number of file updates. It is not uncommon for analysts to underestimate the total volume of transactions by a factor of three or more due to not adequately accounting for the number of inquiry transactions. The majority of transactions in an online system are typically inquiry transactions. Thus, shifting the inquiry function primarily to LAN's has a significant impact on the total mainframe online workload.

Objectives

In developing a system for porting mainframe data to LANs, the PPDS Team established the following general objectives:

- **Minimize traffic between the administrative mainframe and the LAN** — The system should minimize the movement of data between the administrative mainframe and the LAN so as not to tax the administrative mainframe's resources and to make the time required for downloads acceptably short. This means that the system must support incremental downloading, that is, it must be able to identify those records which have had changes made to them so that the changes can be downloaded and posted as updates to the LAN system files.
- **Seamless downloading** — The downloading process must be a single user interaction. In other words, although the system must use incremental downloading, the user should not be required to perform one step to effect an incremental download and then take another action to post the incremental download as updates to the LAN system files.
- **Reuseable system** — The LAN-based system should be reuseable, that is, it should work with other applications and other sets of data without any code changes. This means that all information about the data attributes and interrelationships must be retrieved either from the data files themselves or from "dictionary" files which store information about the data external to the system itself.

Constraints

The PPDS Team also placed itself under a set of constraints to maximize the usefulness of such a system:

- **Centralized support of downloading data** — The downloading of

data from the administrative mainframe must be centralized. This places control of dissemination of the data in the hands of the user department responsible for the operation of the system and also minimizes traffic between the mainframe and the LAN. It also makes possible the use of incremental downloads.

- **Negligible additional software required for users** — The users of the system must not be required to purchase additional software to run it beyond such as things as an appropriate level of DOS.
- **Royalty-free runtime distribution**
- **Must perform adequately on slower machines**

Functionality

The functional requirements of the system are as follows:

- **Multiple versions of the same file structure** — The system must support multiple versions of the same file structure and allow the user to select which version to use in a given set of interactions. For example, the user may elect to have a copy of the month-end employee, appointment, deduct option, etc., files for each month of the fiscal year. The dialogue must allow the user to designate which month-end file he wishes to view.
- **Inter-file relations** — The system must support the definition of standard inter-file relations as well as user-selected relations.
- **Browse capabilities** — The system must allow the user to browse records on a selection screen in order to choose one for display of the detailed information on the record. The list of fields displayed in columns on the browse screen must be user-modifiable and must be scrollable beyond the 80-column display limitation.
- **Extraction capabilities** — The user must be able to extract data from the data bases to transfer to other programs which users can then use for further analysis. Formats supported must include:
 - * ASCII text
 - * Comma-delimited
 - * dBase III Plus
 - * Lotus 1-2-3
- **Indexing capabilities** — The user must be able to view data in different orders, either a pre-defined standard order or one defined by the user.
- **Filtering capabilities** — The user must be able to specify a set of logical selection criteria to "filter" those records which are visible to the application. The application should run exactly the same when a filter is applied.
- **Inquiry** — The user should be able to view data on a record-by-record basis on an inquiry screen. This inquiry screen may either use a set of standard fields or the fields to be displayed may be specified by the user. All code values on the screen should be translated into their appropriate text equivalents.
- **Field List and Filter Criteria Specification, Storage, and Retrieval** — Browse, extract, index, and inquiry field lists and logical filter criteria should be developed with a common interface design using tag or selection lists of English-like field names. All fields in all related files should be available for inclusion in the field lists/filter criteria. Users should be able to save field lists and filter criteria developed by them for later retrieval.
- **Field Value Pick Lists** — Whenever a code value is presented for input, there should be a function key which opens a browse list of the related file for selection of the code value.

- **Report Generation Requirements** — The system must include a set of pre-defined reports to which the user can specify such things as selection criteria, sort order, and levels of summarization.

Design Decisions

The above considerations led to the following design decisions:

- **ADABAS null-suppressed super-descriptors** — All descriptors in HRMIS are superdescriptors since all descriptors are made up of at least the Organization ID (to distinguish and logically separate UNT and TCOM data) and some other field (such as Social Security Number). In ADABAS, if a field making up part of a superdescriptor is defined as null-suppressed and has the default (or null) value, no entry is set up in the associator space for that record. This is useful in setting up processing triggers which are "sparse-indexed" so that the file can be read in logical sequence by that superdescriptor and only those records which have a non-null value in the "trigger" field will be processed. For purposes of supporting the downloading/reporting system a field was set up on each subject file that was set "on" (to a non-null value) whenever a change was made to data in the record which requires that the copy on the PC-based system be refreshed (re-downloaded and updated).
- **PC DBMS** — The decision was made to use a PC DBMS to support the system because of the need to support multiple levels of data, that is, one-to-many relationships between related files.
- **dBase format** — Early in its work with Natural Connection the PPDS Team opted to use dBase format for the records downloaded. This decision was made primarily because Natural Connection downloads appropriate field names

and other characteristics to dBase format files and dBase files are easily ported to other applications. When ported they frequently carry with them the field names and characteristics.

- **Character mode** — Because of the requirement that the system be able to run on lower-level machines and without additional software, the decision was made to make the system run in character mode. Graphical user interfaces (GUIs) frequently require additional software (such as Windows 3.0 and a Windows-based DBMS) and typically run slowly on lower-level models. The GUI-based DBMSs which support dBase formats have not developed to the level of the functional requirements specification either.
- **Clipper and Blinker** — Clipper was chosen as the tool for developing the system because of its ability (with an appropriate linker) to generate royalty-free runtime distributable .EXE modules. It also is supported by third-party libraries which give it the functionality required. Clipper's macro substitution capabilities make it possible to make all of the functions of the system data-driven. Its major drawback is the size of the .EXE files built from its .OBJ files. The team used Blinker to generate .EXE files with dynamic overlays. Blinker reduces the amount of memory needed by the application and also uses incremental linking to speed the generation of the .EXE file.
- **C/MASM interface to Natural Connection** — To make a seamless interface to Natural Connection, the PPDS Team opted to write a generic C interface between Clipper and Natural Connection so that commands could be passed from a Clipper driver to Natural Connection through a C interface to the NC.OBJ stub. The Clipper program can then proceed to post the incremental download to the LAN system files

with all standard indices open. In the process of developing this interface with the Microcomputer Support staff the discovery was made that the memory models for Clipper and Natural Connection were different so an assembler program was written to convert memory models.

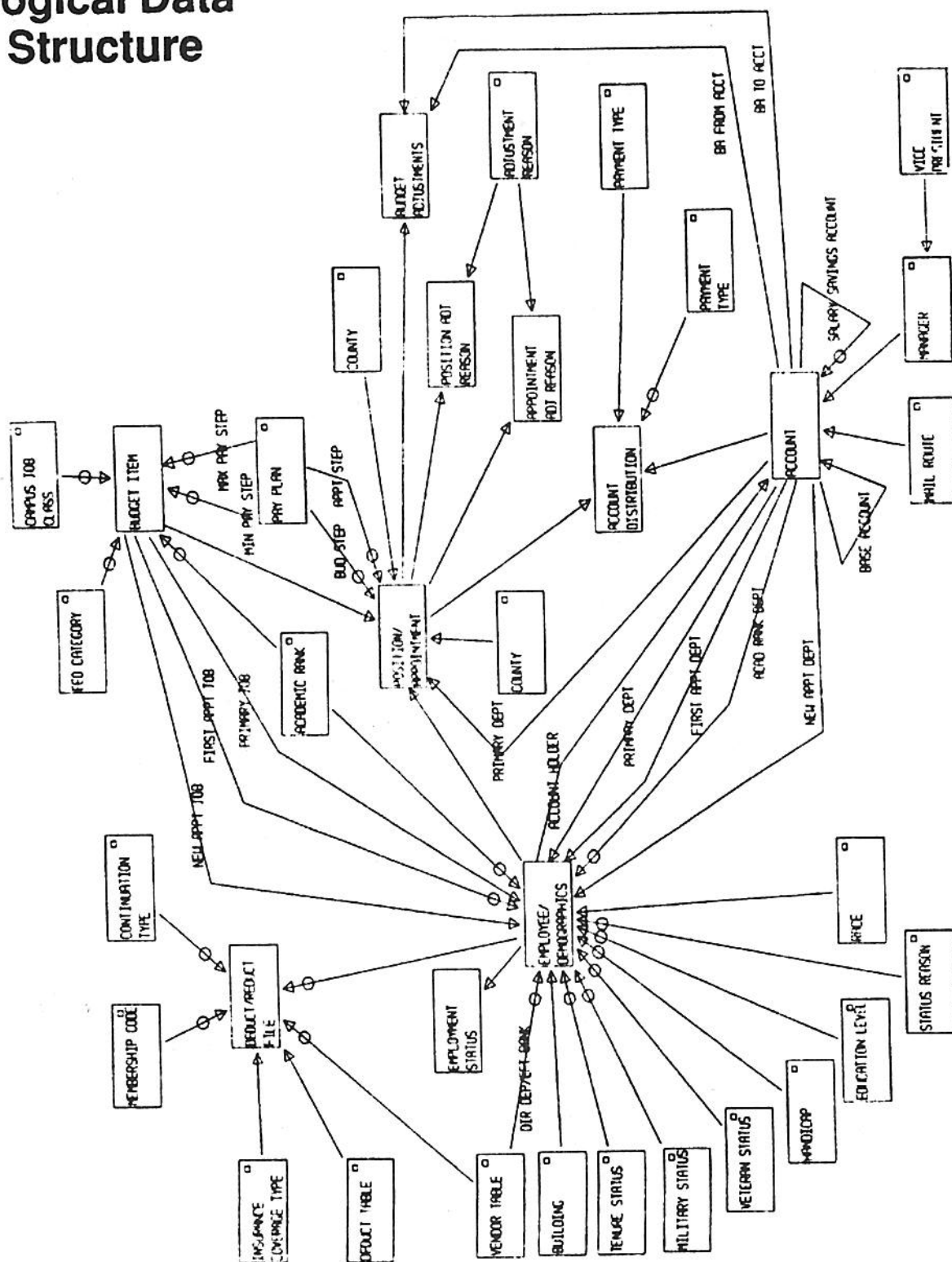
- **Artful.Lib** — Much of the functionality of the system was adapted from the Artful.Lib Clipper function library. Functions in this library enable users to set up logical filter criteria and to store and retrieve them as required by the system. The PPDS Team modified this function to use a dictionary file with more English-like names and to allow the use of pick lists in specifying values. The team then cloned additional functions to support user-specified index order, browse, extract, and display field lists. The browse function is also adapted from Artful.Lib.
- **R&R Relational Report Writer** — The reporting capabilities of the system are provided by R&R Relational Report Writer. This product greatly simplifies the development of report layouts and allows for runtime specification of sort orders, summary levels, and print destinations. It also can use the logical filter criteria established for selecting records to include on a report. R&R Relational Report Writer has a royalty-free runtime module which can be executed from within a Clipper application.

File Design

The following page contains an entity model (logical data structure) diagram of the files used in the system as implemented for use with data from HRMIS.■

ADMINISTRATIVE COMPUTING

Logical Data Structure



COMPUTING TECHNICAL SERVICES

Mainframe Performance Statistics

Operating Systems Performance Statistics for March

CPU	SYSTEM	Planned Production Hours	Production Hours Achieved	System Uptime
ACAD	VM/XA	744.00	740.19	99.5%
ACAD	MUSIC/SP	722.09	716.53	99.2%
ACAD	MVS/JES2	744.00	735.88	98.9%
ACAD	COMPLETA	744.00	722.20	98.8%
ADMN	MVS/JES2	741.27	719.24	97.0%
ADMN	COMPLETA	296.00	286.47	96.8%
ADMN	ADABASA	709.77	679.05	95.2%

- The ACAD CPU achieved 100% uptime in March.
- The HDS/7360 DASD achieved 100% uptime in March.
- The HDS/7380 DASD achieved 100% uptime in March.
- The ADMN CPU achieved 97.0% uptime in March.
- The HDS/7360 DASD achieved 100% uptime in March.
- The HDS/7380 DASD achieved 100% uptime in March.
- The EMC Solid State Disk achieved 100% uptime in March.

Key Causes Of Lost Productivity In February: ACAD CPU

Miscellaneous

1. VM/XA systems software development. 8.66 HOURS

Key Causes Of Lost Productivity In February: ADMN CPU

MPU, Tape, and Disk Subsystems (HDS)

1. Faulty component in 8083 MPU caused main storage in CPU 0 to fail. 16.80 HOURS
 2. Extended install of additional 7880 DASD controller. 3.51
 3. Upgrade of existing 7880 DASD controller & install of additional 7380 DASD. 3.00
- TOTAL 23.31 HOURS

Miscellaneous

1. ADABASA system failure. 9.87 HOURS
 3. Systems software development. 3.54
- TOTAL 13.41 HOURS
GRAND TOTAL 36.72 HOURS

ACADemic (HDS) Program Hit Parade

March Top Ten Programs : Frequency Of Runs

Program	Description	#of Runs	% of Total
1. IEBGENER	IBM Utility	23465	21.9
2. IEWL	Linkage Editor	16796	15.7
3. PGM=*.DD	Compiled Program	14817	13.8
4. IGYCRCTL	VS COBOL2 Compiler	9950	9.3
5. SPCHLCOB	COBOL2 Report Writer	8525	8.0
6. IDCAMS	VSAM Utility	8062	7.5
7. CSMA001	Sort Utility	4635	4.3
8. SASLPA	SAS Version 5.18	4290	4.0
9. ADARUN	ADABAS Utility Module	2904	2.7
10. IEFBR14	IBM Null Utility	2565	2.4

March Top Ten Programs: CPU Seconds Used

Program	Description	CPU Seconds	% of Total
1. SAS370	SAS Version 6.06	292496	58.0
2. COMPLET4	Academic COM-LETE	37661	7.5
3. SPCHLCOB	COBOL2 Report Writer	32778	6.5
4. SASLPA	SAS Version 5.18	30222	6.0
5. PGM=*.DD	Compiled Program	25837	5.1
6. SPSS	SPSS Version 4.0	22653	4.5
7. IGYCRCTL	VS COBOL2 Compiler	12617	2.5
8. SSS4001	Operations Automation	10561	2.1
9. ADARUN	ADABAS Utility Module	9128	1.8
10. IEWL	Linkage Editor	7279	1.4

COMPUTING TECHNICAL SERVICES

Disk Backup Schedules

SYSTEM	BACKUP	DESCRIPTION
Administrative MVS/SP	Daily	Monday - Friday around 7 p.m. (after COM-LETE is shut down) & on Saturday & Sunday if COM-LETE has been up that day.
	Weekly	Full pack dumps taken each Sunday morning.
	Monthly	Full pack dumps taken on the first day of each month.
Academic MVS/SP	Daily	Monday - Sunday during the early hours of the morning.
	Weekly	Full pack dumps taken each Sunday.
	Monthly	Full volume dumps taken on the first day of each month.
MUSIC/SP	Daily	Wednesday - Monday starting at 4 a.m. and lasting about 30 minutes.
	Weekly	Tuesday mornings at 3 a.m., these last about 2 hours.
	Semester	Once a semester, a permanent backup is taken.
VM/XA	VM Weekly	Early every Wednesday morning.
	CMS mini-disks	Daily backup performed early every morning. Weekly backup every Tuesday starting after Midnight.
	Semester	Once a semester, a permanent backup is taken.
VAXcluster	Daily	Incremental backups are performed Monday -Thursday at 6 p.m. Saturday & Sunday at 5 p.m.
	Weekly	Full backups are performed every Friday beginning at 8 a.m. generally last all day.
	Monthly	A "stand alone" backup is performed monthly. Dates and times are given in the system log-on message.
	Semester	Once a semester, a permanent backup is taken.
Solbourne	Daily	Incremental backups are performed Sunday -Friday at at 2 a.m.
	Weekly	Full backups are performed every Saturday at 8 a.m.
	Semester	Once a semester, a permanent backup is taken.



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